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The Abstract Editor is Dr. George Mannheimer, 41 West 51st Street, New York City. Prompt transmission to him of reprints or abstracts of papers on tuberculosis, sanatorium or board of health reports, etc., will promote their early publication in this section.

Abstracts should be sent typewritten on one side of the page only. They should be as concise and compact as the subject matter of the article warrants. They should be headed with a short title, and followed by the full title of the paper, author's name, journal, date, column and page

Case of Urological Tuberculosis.—A woman of twenty-nine was found to be suffering from tuberculosis of the left kidney and bladder in October, 1916. The symptoms had then existed for six months. The left kidney was removed January, 1917. The patient gained 30 pounds and lost many of her painful symptoms. In May, 1919, the symptoms returned. In October, 1919, the right kidney was found enlarged and the right ureteral orifice ulcerated. Instillations of 5 per cent phenol solution were given into the bladder with marked improvement at first, but had to be discontinued later, on account of the pain they produced. At the end of three and a half years the patient was as badly off as at the beginning of symptoms. The case shows the unsatisfactory state of treatment of bladder and kidney tuberculosis.—*Report of a Case of Urological Tuberculosis, M. Zigler, Med. Rec., May 14, 1921,* xcix, 835.

Renal Tuberculosis.—*Conclusions*: (1) Renal tuberculosis is very common and especially so during the third and fourth decades of life. There is practically no difference in the relative incidence of nontuberculous pyonephrosis, renal lithiasis and renal tuberculosis. Lesions pathologically classified under these three heads constitute about 70 per cent of all surgical lesions of the kidney. (2) Vesical rather than renal symptoms predominate. If both vesical and renal symptoms are present, the vesical symptoms will antedate the renal symptoms in the majority of cases. Occasionally there are no symptoms from either the kidney or the bladder, the patient merely complaining of loss of strength and weight. (3) Fewer mistaken diagnoses will be made and the duration of the disease before diagnosis will be shortened if cystoscopy is performed in every case where the pathological urinary findings remain unchanged or only slightly so after several treatments of the bladder. (4) If the catheterized bladder specimen shows pus and no bacteria, and is negative on culture, cystoscopy should be performed without treating the bladder, unless the cystitis demands palliative treatment preparatory to cystoscopy. If the bladder urine shows tubercle bacilli, of course ureteral catheterization and functional tests should be performed as soon as possible. (5) Since typical shadows occur in about 20 per cent of cases of renal tuberculosis, radiograms should be made before cystoscopic examination whenever possible. (6) Even though 70 to 80 per cent of these patients have constitutional symptoms such as loss of weight and strength, fever, chills, and night sweats, it is unfair to the remaining 20 to 30 per cent who are in fair or excellent health to await such constitutional symptoms before making a diagnosis. (7)

Repeated microscopic examinations of the urine, following the method of Crabtree, will show the tubercle bacillus in 75 per cent of cases. (8) Naturally, guinea pig inoculation will be negative unless the tubercle bacillus is present and if present it will probably be found under the microscope if diligently searched for, provided a good technique is used. Consequently the guinea pig test is not often indicated, since it is a slow and somewhat uncertain method.—*The Signs and Symptoms of Renal Tuberculosis: a Review of 125 Reported Cases, W. T. Briggs, Kentucky M. J., April, 1921, xix, 200.*

The Symptoms of Tuberculous Meningitis in Adults.—The classical symptomatology of tuberculous meningitis met with in children is occasionally realized in adults, but this is rare. It must be admitted that when it does occur it is obscure, while in advanced phisthis it is often overlooked. The majority of cases in adults give rise to purely motor accidents. such as hemiplegia, with or without Jacksonian epilepsy and radial paralysis. In other instances the hemiplegia may be either right or left brachial or crural monoplegia, chorea, athetosis, or finally a comatose state. Some patients begin with aphasia or verbal deafness, or the process at the outset may assume the clinical aspect of cerebrospinal meningitis. From this enumeration it is evident that the onset of tuberculous meningitis in adults it far from being like that met with in children. Perhaps, as Chantemesse has pointed out, there may be an early premonitory phase during which an attentive examination might have detected disturbances of the intellect or affectivity, but this is not common, although a few instances have been recorded by Vivant in particular. It is evident that the kind of onset will considerably influence the evolution of the process. A patient suddenly develops coma and dies in a few days without regaining consciousness, but aside from such tragic circumstances there are a number of varieties and forms, intermediary, so to speak, which have a duration of five or six months from the onset to the time of death. For example, a patient may be seized with a right hemiplegia, preceded by an attack of epilepsy, and remain without any change for five months, when coma develops and death occurs some days later. Nothing can be found in the general condition of the patient or the hemiplegia that throws any light on the true cause of the condition. In most instances the hemiplegia is of the limp variety without increase of the reflexes and with Babinski's sign present, while the frequent association of convulsive and paralytic phenomena is hardly sufficient to enlighten the clinician as to the real nature of the affection. Occasionally cases are met with where the paralytic phenomena of the onset are followed by significant symptoms, such as persistent headache, unequal pupils, vasomotor or sphincteric disturbances, stupor, etc., testifying to a tuberculous implication of the meninges. What is striking is the absence, at least at first, of meningeal phenomena. Hemiplegia, monoplegia, chorea, aphasia, etc., are the various conditions presented by the patients. The situation may improve for a while, but after a certain lapse of time the patient dies in coma, or, on the other hand, the affection becomes confirmed by the appearance of meningeal symptoms. Then the symptomatic picture becomes clear and vasomotor disturbances, typical cerebral vomiting, unequal pupils, Kernig's sign, and finally coma successively complete the clinical picture. The temperature chart has nothing characteristic. At times there is hardly any rise until toward the end of the process; at others there is a temperature oscillating around 102°, with remissions to normal; then the mercury rises to between 102° and 104°, and there remains. Occasionally a curious phenomenon occurs: the temperature, which was high, insensibly drops and death takes place in hypothermia. No indications can, therefore, be deduced from the temperature, but what is really interesting and implants a special stamp upon these cases of meningitis is their manner of onset, so that in this respect, aside from the classical form rare in adults, a series of forms may be described based principally on the kind of onset offered: The first is the *latent* form, which does not declare itself for a long time, then suddenly breaks out in an apoplectiform, epileptiform, or delirious attack, rapidly followed by fatal coma. The *delirious* form, in which for months there is no other manifestation than perversions of the intellect or affectivity, or a variable degree of delirium, often ending in acute mania. The *spinal* form, which is most commonly encountered in tuberculous subjects and presents the clinical aspects of ascending myelitis. And finally, the *hemiplegic* form characterized by the localization of a patch of meningitis over the psychomotor zones. Jaccoud describes a *slow and remittent* type in which a phthisical patient is seized with headache, vomiting, and weakness which last for several days and then remit, only to recur five to eight days later. After several similar attacks the meningeal symptoms appear. In Jaccoud's *sudden delirious* form a tuberculous subject is taken with intense headache lasting for twenty-four hours, then coma for one or two days, followed by violent

delirium, and after a few hours coma and death supervene. This observer also describes a form the initial phenomenon of which is either an epileptiform or an aphasic attack, and still another that he calls *latent*, with two modalities, one with headache, aggravation of the general condition, but no fever; ths second with gastric disturbances and headache, also apyretic. The patient weakens and finally is carried off by some cerebral symptom. Such are the various clinical types of tuberculous meningitis in adults, the latent forms expecially characterizing the process in subjects at this time of life.—*Editorial, Med. Rec., May 7, 1921, xcix, 790.*

Nontuberculous Cold Abscesses.—Audain contributes an article on pseudotuberculosis of the cellular tissue to the *Gazette des Hôpitaux* for January 18–20, 1921, xciv, 6. The condition referred to appears to be relatively new. The clinical expression is cold abscess followed by fistulation. In such cases failure to find Koch's bacillus at first suggests some fungous infection, but in the cases referred to the author has never found any evidence of mycosis. The culture and inoculation methods have invariably been negative. The age of selection seems anywhere from fifteen to forty-five and the author has seen many cases among the indigenous inhabitants of North Africa. While usually small—the size of an egg or mandarin orange—the author has seen abscesses which gave exit to a quart of pus. The physical appearance of the latter recalled a fungous infection, rather than tuberculous pus. Clinically it was impossible to exclude tuberculosis, and the fistula or ulcer formed after evacuation also resembled exactly that of tubercle. The golden hue of the pus was the only feature, aside from negative microscopic finds, to cause suspicion of the nontuberculous nature of the process. The possibility of syphilis never even suggested itself seriously. The author recalled that cold abscesses have at times been traced to the staphylococcus, but this organism could not be accused in these cases. The condition responded well to the treatment of tuberculous cold abscess. The abscesses are often multiple and no very deep seated lesions have been seen, although the author believes that a case of empyema may have been of this character. It is possible, of course, that the tubercle bacillus or some undescribed fungus may have been responsible, even although all attempts to locate them repeatedly failed.—*Editorial, Med. Rec., April 9, 1921, xcix, 615.*

Pulmonary Syphilis Simulating Tuberculosis.—Three cases are reported from the Phipps Institute and the following conclusions are arrived at: (1) Syphilis of the apices of the lungs is not by any means a rare condition and there are many cases of this disease being treated for pulmonary tuberculosis. (2) We should avail ourselves more frequently of the Wassermann and other blood tests in private practice in cases giving signs and symptoms of active tuberculosis but not giving positive sputum. This should be done whether a history of a primary luetic lesion is obtainable or not, realizing that syphilis is often innocently acquired. Signs of an aortitis, of a perihepatitis, or of weak or suppressed breath sounds, should make us suspect syphilitic infection. By pursuing such a practice there is no doubt that we will arrest some cases which are running a rapidly downward course.—*Syphilis of the Lungs Simulating Tuberculosis, H. M. Minton, N. York M. J., June 1, 1921, cxiii, 813.*

Pulmonary Syphilis.—The author has been making a systematic search for lung syphilis since 1916 by including this disease as a possibility in every lung examination. Several fundamental facts soon became apparent: 1. The peculiarities in the anatomical structure of the lung, as demonstrated by Miller, with the relations between bronchi, arteries and lymphatics, have an intimate bearing on the interpretation of the shadows of all pulmonary lesions, including lung syphilis. 2. The characteristic method of invasion of active syphilis, wherever found, by extension along the arteries, is distinctly different from the extension of tuberculosis through the lymphatics. A consideration of the relations of lymphatics and arteries to the pulmonary subdivisions which are involved indicated that there would be a distinct difference in the shadows of these two diseases. 3. Aside from the pathological differences, the clinical observation had been that the lesions of tuberculosis and syphilis occurred, as a rule, in different parts of the lung, the former in the upper and the latter in the lower lobes. 4. The characteristics of the shadow of tuberculosis being already definitely established, the differentiation would be between syphilis and other less common types of lung disease. The following therapeutic suggestions were derived: First, in the treatment of systemic lues, it is important to know whether the lungs are involved, since a Herxheimer reaction in the lungs may be serious. Second, it is doubly important, in tuberculosis, to ascertain

whether the patient combats this comparatively benign single infection or whether a sinister combination with active syphilis must be treated. Third, it may be triply important not to disturb the fibrotic changes of latent syphilis by arsenical treatment, if the tendency of this fibrosis is to arrest the tuberculosis.—*X-Ray Shadows of Lung Syphilis and Syphilitic Tuberculous Symbiosis in the Lungs, W. W. Watkins, Am. J. Roentgenol., May, 1921, viii, 259.*

X-Ray Treatment of Pulmonary Tuberculosis.—For seven years the author has been treating consumption with X-rays and claims decided benefit for most of them. He gives three treatments a week, alternately exposing the anterior and posterior chest, using 2 to 3 m.a., 6 inch spark, 15 inches in diameter, 5 to 10 minutes time, and 3 mm. of aluminum as filter.—*X-ray Treatment of Pulmonary Tuberculosis, W. Wilkinson, Am. J. Roentgenol., May, 1921, viii, 241.*

Induced Pneumothorax.—Lung lesions heal but slowly because the constant distention of the organ renders coaptation of the diseased parts impossible. By the induction of a successful collapse the following results are accomplished: the diseased lung is put at rest, coaptation of diseased surface is made possible, inflammatory or necrotic material is expressed from the alveoli or from cavities, absorption of toxins is inhibited, further extension of the disease is arrested and hemoptysis is prevented. Artificial pneumothorax is a valuable adjuvant in the management of selected cases of advanced pulmonary tuberculosis in which other measures have been of no avail. It frequently gives temporary symptomatic relief, but very rarely brings about a cure. In lung abscess its dangers outweigh its possible good effects.—*Induced Pneumothorax in the Treatment of Pulmonary Tuberculosis, B. Stivelman, N. York M. J., April 6, 1921, cxiii, 521.*

Tuberculosis and Decalcification.—That tuberculosis is to a certain extent a state of decalcification was shown by Ferrier. Pochon discusses the subject in the *Journal de Médicine de Paris* for March 10, 1921, xl, 7. The belief in a lack of lime in the tuberculous organism does not tally very well with the facts, according to Pochon. The recent famine conditions in Europe have been responsible for much tuberculosis and various conditions of the bones of a decalcifying character, but the two classes of patients seem quite distinct. We sometimes see the statement that scrofulo-tuberculous children often present a slight degree of rickets. To convince one that the average tuberculous individual is more decalcified than the average man it would be necessary to show the coexistence of the deformities of late rickets, brittle bones, etc. Pochon gives an account of a highly tuberculous family in which the disease must have spread from person to person. The normal growth rate and the absence of stigmata of rickets, etc., apparently went to show that the lime metabolism had originally been normal. One of the children, who was known to have been tuberculous at the age of eleven, later became robust, and at the age of nineteen was able to play football. During a game of the latter he developed a fracture which could only be understood by the presumption of fragile bones. Radiographs showed absence of callus during the healing process and the entire skeleton showed low lime content, judging by the weak shadows. The fracture failed to unite firmly, and after six weeks in plaster a second dressing of the same kind was necessary and at present the patient is wearing a brace. There is no pseudoarthrosis but union is not firm and the limb cannot be trusted to withstand a strain. At a later period tuberculosis brusquely reappeared in the lungs, as if associated with the poverty in lime of the organism.—*Editorial, Med. Rec., May 28, 1921, xcix, 925.*

Creatinin in Pulmonary Tuberculosis.—Three groups of five cases of pulmonary tuberculosis, uncomplicated as far as could be determined clinically, were selected in accordance with Rathbun's classification, as representing three progressive grades of disease activity. The cases were all males and care was taken to select no patients showing evidence of obesity, and to exclude adolescent and senile types. On the basis of the data secured in the study of these cases, it seems that, in apparently clinically uncomplicated cases of pulmonary tuberculosis, the creatinin coefficient is slightly below the average normal figure, and that it reaches its greatest height in middle-grade cases, that is, those in which increased katabolism, due to disease activity, has not yet been offset, by excessive tissue waste and generally lowered vitality.—*The Creatinin Coefficient in Pulmonary Tuberculosis, T. Raphael and Nina Eldridge, Arch. Int. Med., May 15, 1921, xxvii, 604.*

Control of Cattle Tuberculosis.—Pennsylvania began an active campaign to control tuberculosis in cattle in 1896. Since then this work has been continued as rapidly as funds, authority and assistance would permit. During the period from 1896 to

1919, 272,895 cattle were tested with tuberculin under state supervision. Of this number, 32,392 failed to pass the test. Tuberculin testing met with considerable opposition at first, but practically all of the earlier objections have proved to be unfounded. Tuberculin is not infallible. It is considered about 95 per cent accurate. Its greatest degree of accuracy will be found in animals that have not been previously tested. It is not unusual for a dangerous spreader of the disease to pass a satisfactory tuberculin test. For a number of years only subcutaneous tests were used; when retests were necessary the dose was doubled and ln some cases quadrupled; but it was not possible to increase the dose sufficiently to detect all infected animals. Later the intracutaneous and ophthalmic tests were introduced and have proved most helpful. In heavily infected herds a combination of two or all three of these tests is often used with excellent results. In general, the subcutaneous test is considered the most reliable of the three. The ophthalmic test is perhaps the least reliable for the reason that the reaction lasts but a short time. The reaction to the intracutaneous test remains three or four days. It is recognized and accepted by a number of states. Pennsylvania has not yet decided to accept it for cattle for interstate shipments and recommends its use only in combination testing. A well-marked reaction to any of the three tests is considered reliable evidence that the animal is affected with tuberculosis. The state has never attempted to force herd owners to submit animals to a tuberculin test. The best progress has been made in coöperation with the owners. The manner of handling tuberculosis is known as the Pennsylvania plan. Thirteen hundred herd owners have signed an agreement to such a plan; their herds having been tested in some cases more than once. There are 22,000 cattle in these herds, 8 per cent of which failed to pass the test. Animals that react to the test are slaughtered under state or federal supervision; the owner is entitled to all receipts from the hide, carcass and offal. It is generally understood that tuberculosis is communicable from animal to animal, and that if it is allowed to run unchecked in a herd it will eventually render a large percentage of the animals unprofitable and worthless. Any measures for controlling it must be based upon a practical application of the principles of bacteriology. The better these facts are known the better will be the results obtained in controlling the disease.—*Measures for the Control of Tuberculosis in Cattle, C. J. Marshall, N. York M. J., April 6, 1921, cxiii, 525.*

Tuberculin Hypersensitiveness.—Summary and conclusions: 1. When a guinea pig with well developed peritoneal tuberculosis is injected intraperitoneally with about 20 cc. of a heavy suspension of a virulent tubercle bacillus death occurs within twenty-four hours or the animal becomes extremely toxic. Such a peritoneal tuberculosis develops in about 1 month after 1 cc. of a very heavy suspension has been introduced into the abdominal cavity. If the viscid fluid which is contained within the peritoneal cavity is mixed with saline solution and passed through a Berkefeld filter a bacillus-free filtrate is obtained which induces in normal guinea pigs a certain degree of cutaneous hypersensitiveness to tuberculin. 2. The abdominal organs and the parietal peritoneum to which masses of leucocytes and tubercle bacilli are adherent, when crushed and extracted with saline solution, yield a filtrate which likewise induces a cutaneous hypersensitiveness. 3. The cutaneous hypersensitiveness does not appear before the seventh or eighth day after the filtrate injection and is therefore considered to be the result of an active sensitization of the animal.—*Tuberculin Hypersensitiveness in Nontuberculous Guinea Pigs Induced by Injections of Bacillus-Free Filtrates, F. A. McJunkin, J. Exper. Med., June, xxxiii, 751.*

Studies in Immune Biology, Disposition and Constitution and Tuberculosis.—Immune biology seeks to explain the interaction of two living beings. A complete explanation of this interplay will probably never be possible by it. Constitutional pathology seeks to understand the relationship between development of disease and the peculiarities of the human body. This explanation will probably also remain incomplete. The understanding of these interactions is of great importance for the control of infectious diseases. Natural and acquired immunity are basically different. The former is the absence of cells sensitive to stimuli in vital organs. The latter is increased ability to resist. The former affords absolute protection, the latter only relative protection in most infectious diseases, which can be overcome by the vigor of a new attack. The conditions in tuberculosis are most variable. Here the biologic relations frequently undergo fluctuations for years and decades without definite final decision. A body is called predisposed to an injurious external agent when it shows less resistance to these agents than the average. The conception of disposition excludes strictly the presence of that disease. Its practical application and correct limitations meet with great difficulties. This

is especially true of diseases which develop slowly and may exist for considerable time without striking symptoms. The conception of disposition of organs has been similarly misunderstood. While the importance of constitution is generally admitted there is at present no uniform understanding of it. Some conceive constitution as a changeable condition of the body, resulting from the sum of all inherited and acquired characters and modes of reaction. Others understand by constitution an original unchangeable condition determined by the germ plasm of the parents. Constitution influences resistance. Are acquired properties predisposing factors or signs of existing disease? Both possibilities may occur in one and the same case. The difficulties to be overcome by studies in constitution are of a nature similar to those of immune biologic studies. In the study of tuberculosis at first the bacteriological standpoint, and later the one-sided disposition and constitution studies were overemphasized. It is a question of attack and defense. Tubercle bacilli and the human body have been reacting upon each other for thousands of years with resulting mutual adaptation. There is no absolute immune protection against tuberculosis; only a conditional one. Tuberculosis, as it affects us, is characterized by slow development, absence of symptoms for years and tens of years, and a changeable course. The chronic forms of tuberculosis may hinder the development of the growing body in various ways, and may produce a variety of earmarks of a weakened body. It is often difficult to decide whether these earmarks are sequelae of an existing tuberculosis or whether they are predisposing factors, produced on a different basis. While it is conceded that congenital predisposition to tuberculosis is possible, it must be assumed that in some cases congenital infection with tuberculosis occurs. Similar questions, difficult to answer, come up, when congenital and unalterable constitutional predisposition is considered. Is the weakened, less resistant constitution a heritage from the germ cells of the parents, or is it a result of disease of the growing body? Here again both conditions are possible and may in rare cases coexist. An example of the most frequent weak constitution is the asthenic type of Stiller-Wenckebach asthenic constitution found to be frequent in the Frieslander. No tuberculosis without asthenic constitution was observed in them, but numberless cases of asthenic constitution without tuberculosis were found. In the Alsatians asthenic constitution is rare but tuberculosis common. The constitution is unalterable. If it is considered to be of prime importance, our struggle against tuberculosis becomes hopeless. On the other hand we are able to influence sequelae of primary stages of unrecognized tuberculosis by timely prophylaxis and treatment. Prophylaxis against infectious disease consists in removing the causative organism, or in protecting the individual against the action of the organism. Neither can be accomplished perfectly in the case of tuberculosis. But we must endeavor to render innocuous the seriously ill with active sputum from whom massive and repeated infection can arise. Any measure leading to increased power of the cells and decreased power of the invading organisms offers prospects of success. The mode of life certainly influences the general capacity of the body and the ability to resist tubercle bacilli. The majority of the tuberculous who are in dire need of sanatorium treatment do not receive it, while a large number of the tuberculous are taken care of in sanatoria long after they have ceased needing such treatment. The chronic tuberculous person has the best prospects of permanent recovery under conditions of life which he is accustomed to. In immune biological treatment various forms of energy are employed. Mechanical, physical, chemical and biological remedies are allowed to act on the diseased body and especially the involved foci. In the varying sensitiveness of the tuberculous body to specific stimuli we possess a method of regulating the relationship between attack and resistance. We must distinguish between favorable and unfavorable decrease of sensitiveness—positive and negative anergy. The employment of specific stimuli is most difficult, but also most promising. Rigid rules are out of place, because the conditions in the individual cases are too varying. We possess no prophylactic or active treatment applicable in all cases and under all conditions.—*Immunbiologie; Dispositions- und Konstitutionsforschung; Tuberkulose, H. v. Hayek, Berlin, 1921; Verlag von Julius Springer.*

Rôle of Immunity in Tuberculosis.—In this paper some of the current views on the rôle of immunity in tuberculosis are presented. Immunity carries with it, as a corollary, localization. Immunity is always relative. Complete immunity to any disease does not exist. Tuberculosis localized in the lungs presupposes a certain amount of immunity. It is believed that every adult will react to tuberculin if given often enough and in sufficiently large doses. The acquisition of immunity to tuberculosis begins very early. It has been observed

that in a family of healthy children who become exposed to tuberculosis by a consumptive living in the house, the children over four years were unaffected by the direct exposure while those under that age suffered an impaired development. Every child has abundant opportunity for infection. Children in healthy surroundings have a better chance of getting a small infection and better vaccination. Bushnell holds that once living tubercle bacilli gain entrance to the body, they or their progeny remain in the body in a living state and so promote and maintain immunity. If the tuberculous subject were capable of entirely eradicating his tuberculosis, he would lose his immunity and thus render himself susceptible to a new infection. It is not unusual to find tubercle bacilli circulating in the blood of individuals who have not and do not develop severe tuberculosis. It is believed that transmission of pulmonary tuberculosis to adults through transient association with that disease does not exist. The results of the antituberculosis campaign have been somewhat disappointing. Recent improvements in the social and hygienic condition of the working classes who constitute the majority of the candidates for the disease must be a factor in the future, if not in the present, tuberculous morbidity and mortality. But the adaptation of people to city life and to tubercle bacilli is perhaps of greater importance than all the factors taken together, in bringing about the mortality reduction which has occurred.—*Some Observations upon the Rôle of Immunity in Tuberculosis, H. F. R. Watts, Boston M. & S. J., March 10, 1921, clxxxiv, 241.*

Tuberculosis Immunizing Vaccine.—Since 1906 human, bovine and avian tubercle bacilli have been subcultured by the author every month. The present growths represent the 184th generation. The growths are still luxuriant and true to type, but they do not produce tubercles and are completely nonpathogenic to animals. The pathogenicity has been tested every year. No change was noted until the 94th generation. After that time attenuation became marked, and after a year or two the cultures were avirulent. Treatment of disease by vaccines prepared from attenuated organisms naturally means that the production of antibodies will take place rapidly without any preliminary shock to the system, such as invariably follows the injection of vaccines prepared from virulent strains of bacteria. With a view to elucidating the real amount of tuberculosis in man caused by the human and bovine types of bacilli, and also as to immunity produced by one infection toward the other, Raw instituted clinical observation on a large scale in a Liverpool hospital of 900 beds, of which he had charge for eighteen years. In no case of primary pulmonary tuberculosis did he observe, during the course of the illness; tuberculosis of bones, joints, glands or skin, nor any instance of meningitis. Among the surgical cases of tuberculosis, 28 developed lung symptoms and 25 died. In all cases the infection of the lung was either by direct extension from cervical lymph nodes to the apex of the lung, or from a primary focus in the abdomen extending upward through the diaphragm to the bronchial nodes and lungs. This large clinical experiment convinced Raw that the human body is attacked by two quite distinct forms of tuberculosis: the one conveyed from person to person by direct infection and attacking chiefly the lungs, and the other conveyed by milk from tuberculous cows, and developed in the first few years of life. These two diseases are caused by different types of tubercle bacilli which will not live in the body at the same time; and one disease produces immunity to the other. Hence, Raw always uses a vaccine prepared from bovine cultures in the treatment of the human infections and vice versa. The vaccine which he has had prepared from his attenuated cultures is an emulsion of the bacilli, and contains all the products of the bacillus. It is nontoxic and avirulent, and produces no reaction even in large doses. For purposes of immunization in susceptible children 6 injections are given at weekly intervals. This course is repeated in 3 months. The doses recommended are 0.001, 0.002, 0.003, 0.004, 0.005, 0.006 mgm. No symptoms have been observed to follow these injections. In the treatment of the active disease the doses are much larger than have been possible up to now. At least 12 injections should be given at intervals of seven days in doses increasing from 0.001 to a maximum of 0.025 mgm. The vaccine should be freshly prepared from the cultures and should not be used after one month. It can be used with complete safety in any stage of the disease, and even in advanced cases great relief from night sweats and toxic symptoms have been noted. The results in suitable cases are excellent. Raw has succeeded in immunizing completely highly susceptible animals by the use of attenuated cultures, and he firmly believes that if all children with a tuberculous history could be safely vaccinated in the manner described they would be placed in a better position to resist infection at home.—*A Tuberculosis Immunizing Vaccine, N. Raw, Brit. M. J April 23, 1921, no. 3147, 594.*

The Operative Treatment of Pulmonary Tuberculosis.—In judging the success of operative treatment of pulmonary tuberculosis it must be remembered that the disease has usually progressed to a considerable degree and has withstood all other attempts at treatment. Jessen discusses the following methods of operative procedure: extirpation of the tuberculous lung, opening of cavities, artificial pneumothorax, extrapleural thoracoplasty, filling of cavities and pleurolysis, extrapleural pneumothorax with thoracic fistula, phrenicotomy, stretching of the sympathetic nerve and operation on the intercostal nerves, ligation of the pulmonary artery and similar methods, and widening the upper chest aperture. Extirpation of a large portion of the lung necessitates simultaneous thoracoplasty which makes the procedure a major one. If it is not possible to remove the tuberculous focus radically the next task is to avoid further absorption of toxic products. The chances for opening tuberculous cavities in general are poor, except in the case of isolated cavities, bound by adhesions. Therapeutic pneumothorax is a much safer and more promising method. It is the surgical procedure in pulmonary tuberculosis which must be considered in every case before deciding on any other method. Probably no case should be under pneumothorax pressure less than eighteen months, although the author has seen connective tissue changes after four months. The most important property of artificial pneumothorax is its detoxicating effect; therefore, compression of the outgoing blood and lymph vessels rather than simple collapse of the lung must be aimed at. The most important obstacle to the success of pneumothorax is adhesions of the pleura. In some patients with adhesions a multiple pneumothorax with many chambers can be produced. Sometimes adhesions can be removed surgically, but in general the author warns against bloody intrathoracic removal of adhesions. The significance of exudates after pneumothorax depends on their toxicity. An exudate causing no fever may be beneficial as the compression is made more complete. There are certain permissible and doubtful indications for pneumothorax. Certain indication is furnished by severe unilateral affection with absent or slight adhesions and soundness of the other lung. Permissible indications are severe affection of one side with fresh adhesions, severe affection of one side and slight affection of the other, severe affection of one side without adhesions, with protracted hemorrhage, severe hemorrhage of one side, the other lung not being involved too much, and slight involvement of one side which has resisted all other treatment. Doubtful indication is the severe involvement of one side and involvement of the lower lobe of the other lung. Contraindications are extensive disease of the better lung, extensive and firm adhesions of the side to be treated, serious complications in other organs, and caseous pneumonia of the affected side. Poorly managed pneumothorax is worse than none at all. Extrapleural thoracoplasty must be considered when firm adhesions make pneumothorax induction impossible. While it is a more serious procedure the lasting results are better in the severe cases. The cavities clear up and connective tissue proliferation occurs. The indications are evident failing of the patient's health without operation, unilateral involvement or good function in the other lung, adequate general condition, and impossible or insufficient pneumothorax. Success depends on the condition of the lung involved. If there is sufficient healthy tissue to ensure elastic compression, results are excellent. The main requisite of this operation is timely performance rather than its being resorted to as *ultimum refugium*. It is almost always advisable to perform it in two stages, especially in weakened patients. Tuffier originated the filling of cavities with lipomatous tissue. Bar introduced paraffin as filling material. Jessen filled ten cases with paraffin, and found that in a number of them the fillings were ejected aseptically. As to pleurolysis, its disadvantage lies in the fact that in the cases where it is most urgently needed it frequently is not successful. Because there are cases which are not sufficiently influenced, either by intrapleural pneumothorax or by thoracoplasty, Jessen proposes extrapleural pneumothorax with resulting fistula which remains open indefinitely, in order to prevent reëxpansion of the lung. It may be recommended in certain exceptional cases. By cutting the phrenic nerve Stürtz intended to put the involved lung at rest. While phrenectomy may produce a paralysis of the corresponding half of the diaphragm, its effect on the lung is only slight. It may be used as a supplementary procedure but in general is not very effective. From the nature of tuberculosis it is to be expected that operative success is not so uniform as in healthy individuals. But it is certain that operative treatment helps and even cures many patients who would die without it. It does not obviate the search for other remedies. The expectation of the future lies in the combination of climatic and immunizing treatment with operative procedures. The internist and the general

practitioner must recognize the right time for operation.—*Die operative Behandlung der Lungentuberkulose, F. Jessen, Leipzig, 1921, Verlag von Curt Kabitzsch.*

Cauterization of Adhesions in Pneumothorax.—Of 40 cases in which cauterization was performed, 30 had a satisfactory result. Complete or sufficient compression of the lung was obtained in 27 out of 37 cases, which had adhesions to the apex and the lateral chest wall, as well as in 3 cases of adhesions to the diaphragm. From these 30 cases 4 must be deducted in which the operation was followed by a serous pleurisy or a tuberculous empyema, with serious consequences to the patients. In 26 out of 40 cases, therefore, a satisfactory pneumothorax was obtained and the operation was of genuine benefit. It would naturally be of interest to see whether the permanent results would be better in these cases than in pneumothorax cases in which this operation was not performed, but as yet there are not sufficient statistics for such a comparison. The immediate effect of cauterization justifies the operation as an adjunct to the pneumothorax treatment of pulmonary tuberculosis. As to the indications and contraindications, the string and membrane-like adhesions are best for the operation. Broad bands of adhesions are also suitable to a certain extent, but nothing can be said with certainty in advance as to the prospect of success. In 4 cases of the latter variety cauterization was done in two sittings, and it is quite possible that the use of the method can be extended in this way.—*The Cauterization of Adhesions in Pneumothorax Treatment of Tuberculosis, H. C. Jacobaeus, Surg., Gynec. & Obst., June, 1921, xxxii, 493.*

Management of Pleural Effusions in Therapeutic Pneumothorax.—*Summary*: The immediate effects of serous effusions occurring during pneumothorax treatment are usually beneficial; but ultimately they cause premature reëxpansion of the lung and obliteration of the pleural cavity. Therefore it is unwise to discontinue the treatment and adhere to the dictum of "leave effusions alone." Small, transitory effusions which do not alter the intrapleural pressure require no special attention. Moderate effusions which do not displace the mediastinum and do not interfere with the continuation of the pneumothorax need not be aspirated, but the pneumothorax should be continued with increasing intrapleural pressure to prevent obliteration of the pleural cavity. Large effusions should always be aspirated and replaced by air and the pressure regulated according to the needs of the individual case. Purulent effusions should always be aspirated and replaced by air, not only because of their toxicity, but also on account of their tendency to produce extensive adhesions and obliteration of the pleura.—*Management of Pleural Effusions in the Course of Therapeutic Pneumothorax, B. P. Stivelman and J. Rosenblatt, J. Am. M. Ass., July 2, 1921, lxxvii, 12.*

Two Cases of Surgical Thoracic Tuberculosis.—In the majority of cases closed operations are followed by excellent results. But in some cases the lesions are so diffuse that more extensive open intervention is preferable. Two cases of this sort are reported. A young man of twenty presented a large tumor on the left side of the chest, indurated but not fluctuating. Puncture yielded a small quantity of stringy pus mixed with blood, which passed with difficulty through a large needle. Four days later, aspiration was again attempted, this time yielding no pus. Because of the difficulty in emptying the abscess and its rapid extension, operation was decided upon. The purulent mass was found to be located under the pectoralis major, which was indurated, lardaceous and infiltrated with bluish granulations. The same condition was found in the pectoralis minor. The abscess was opened and the two muscles resected. Bone and cartilage were not involved. Calot's fluid was injected nine days later, and the wound was found to be cicatrized two weeks later. There is no notable impediment of the movement of the arm. The second case concerns a man forty-eight years of age, whose left hemithorax had become enlarged and painful. No concomitant lung tuberculosis was found. Fistulae, discharging a great deal of pus, and the general condition grew steadily worse. At operation, the infiltrated tissues were resected, including the costal cartilages which contained numerous abscesses. The left border of the sterum was carious and friable, but osteitis involved practically the entire sternum, which was therefore removed, except the healthy manubrium. Almost all the left costal cartilages were also removed, leaving the pericardium bare. Improvement was marked. Suppuration persists, but to a much smaller degree. Undoubtedly both cases were markedly benefited by the operation.—*Deux cas d'intervention large pour tuberculose thoracique (ablation du grand et dn petit pectoral, résection du sternum), L. Moreau, Progr. Méd., April 23, 1921, no. 17, 181.*

Antagonism Between Different Parts of the Spectrum.—Results obtained by ultraviolet light can be diminished if the proportion of red or infrared rays is increased without changing the intensity of the ultraviolets. Raw cotton is bleached when exposed to the quartz mercury light, but when solar rays or the infrared or visible rays or ordinary electric rays are added, the bleaching process can be stopped or become slower. A skin erythema induced in five minutes by the quartz mercury lamp will require seven minutes if infrareds or a sufficiently powerful light are added. Fluorescent effects on sulphides produced by ultraviolet radiation occur only with wave lengths greater than the orange; shorter wave lengths are reinforced. The antagonism between divisions of the spectrum is difficult to demonstrate with sensitized papers or even photographic plates.—*Phénomènes d'antagonisme entre diverses radiations (ultraviolet, spectre visible, infrarouge), H. Pech, Compt. Rend. Acad. d. Sc., 1920, clxx, 1246.*

The Action of the Ultraviolet Rays on the Cell.—The action of ultraviolet rays on the sea urchin's eggs can be summed up as follows: The rays affect the protoplasmic layer by coagulating the colloids and augmenting its permeability. The surrounding ions during the penetration precipitate the colloids and proteins of the cytoplasm which surround the colloidal droplets and the lecithins. These, then becoming free, unite to form a hyalin mass. This hyalin mass is decomposed and gives origin to a base (cholin?). This, increasing the decomposition, sets free the OH ions, which provoke a swelling by imbibing the colloids and proteins of the cytoplasm up to complete disintegration of the cell.—*Sur le mécanisme de l'action des rayons ultraviolets sur la cellule, S. Tchabotine, Ann. de l'Inst. Pasteur, May, 1921, xxxv, 321.*

The Use of Ultraviolet Rays in the Preparation of Vaccines.—Emulsions of typhoid and chicken cholera bacilli were prepared with sterile saline solutions, filtered through sterile paper, exposed for twenty minutes to ultraviolet radiation and inoculated into guinea pigs, 1 cc. for every injection. Injections were repeated three or four times at intervals of five days. Controls were carefully carried out. The conclusion was reached that the radiations rendered the cultures harmless without causing a loss of vaccinating property. One inoculation of a culture rendered the guinea pig immune to infection.—*Sull' uso dei raggi ultravioletti nella preparazione dei vaccini, R. Lanzilotta, Ann d'Ig., 1920, xx, 245.*

The Influence of X-rays on the Development of Tuberculosis.—Guinea pigs were exposed to massive doses of X-rays, then inoculated on the following day intraperitoneally with cultures of tubercle bacilli. There was no difference between the time of the appearance of the disease in the rayed animals and that in the controls. In another series in which a second exposure was made several days after the first radiation, death occurred almost at the same time as in the controls. Another series in which two exposures were made before inoculation showed no variation. There was no marked difference in degree at postmortem between the lesions in the exposed animals and the controls. However, exposure to X-ray did show a marked metabolic effect by producing a rapid loss of weight, and also a great decrease in the number of leucocytes and the percentage of lymphocytes, which was more noticeable as the radiation was prolonged. The epithelioid cells and large mononuclears were normal, allowing the inference that these cells did not originate from lymphocytes.—*Influence de l'exposition aux rayons X sur l'evolution de la tuberculose, J. Weinberg, Schweiz. med. Wchnschr., 1920, i, 14.*

Universal Light Baths in Ophthalmology.—Six years experience at the Finsen Institute, in treating about 200 patients with diseases of the eye and lupus, has taught the author that only conservative claims can be made for this method of treatment. The source of light was the carbon arc lamp. The periods of exposure, beginning with fifteen minutes, reached two hours. The conditions treated were phlyctenular conjunctivitis, keratitis, scleritis, diseases of the lachrymal passages, chronic iritis and iridocyclitis. All had been previously treated with the usual local applications and the only change was the inclusion of light baths. Only in tuberculous scleritis and iridocyclitis did these general radiations accomplish beneficial results. Rapid vascularizing was detected in most cases. It was suspected that phlyctenules were even provoked by the treatment. The baths can stimulate focal reactions which are analogous to those produced by tuberculin. Young patients responded better than older ones.—*Det universelle Lysbad i Ophthalmologien, K. Lundsgaard, Hosp. Tid., 1920, lxiii, 849.*

X-Ray Treatment of Laryngeal Tuberculosis.—The results are favorable but not conclusive. Some cases offered great encouragement and others made the author sceptical. The wisest procedure appeared to be to employ the cautery first, to eliminate the diseased tissue, and then to prevent recur-

rence by X-ray exposures.—*Über Röntgenbehandlung der Kehlkopftuberkulose, C. Kümmell, Verhandl. d. Gesellsch, deutsch Naturf. u. Ärzte, 1920.*

Treatment of Laryngeal Tuberculosis with the Arc Light.—Patients, lying down and stripped, were exposed to four carbon arcs of twenty ampere current, first for fifteen minutes, in the second week for thirty minutes, and so on until one hour was reached daily. Treatment was continued for many weeks and months. Of 74 really severe cases, 3 were healed, 35 improved, 6 uninfluenced, and 16 became worse while under treatment. Almost all had second stage pulmonary tuberculosis. Especially good were the results with ulcerations and edematous swellings in the interarytenoid space. Silence treatment was also carried out. With the larger infiltrations the cautery was also employed, as well as other surgical procedures. In one group, the laryngeal condition was favorably influenced, while the pulmonary and general condition became worse. No method offers better results for laryngeal tuberculosis than the combined employment of carbon arc radiation with local surgical treatment.—*Behandlung der Larynxtuberkulose mit universellen Kohlenbogenlichtbädern, N. R. Blegvad, Deutsche med. Wchnschr., 1920, lxvii, 621.*

X-Ray Treatment of Pulmonary and Intestinal Tuberculosis.—The problem of X-ray treatment of pulmonary tuberculosis is chiefly one that involves the knowledge of the anatomy of the lesion and the employment of proper dosage. The X-ray works only on tuberculous granulation tissue and the treatment is suited only for slowly progressive and stationary types, as well as for nodular and cirrhotic types; it merely helps along the natural healing tendencies. The technique must be suited to individual cases, varying the dose and the intervals. Larger doses and shorter intervals are employed particularly in bronchial and lymph node tuberculosis and the more favorable pulmonary cases; smaller doses and larger reaction periods in the progressive cases. The author shows many X-ray plates to demonstrate the fibrosing effect of the X-ray. It is necessary to employ this treatment in a sanatorium under careful supervision. The results with intestinal tuberculosis have proved very favorable.—*Die Behandlung der Lungen- und Darmtuberkulose mit Röntgenstrahlen, A. Bacmeister, Verhandl. d. Gesellsch. deutsche Naturf. u. Ärzte, 1920.*

X-Ray Treatment of Peritoneal Tuberculosis.—Excellent results were obtained in all cases of tuberculous peritonitis without ascites, but with marked adhesions, regardless of the involvement of the genital organs. Operative intervention gives bad results. After an exploratory laparotomy in the miliary type with ascites, the treatment was also valuable. If the serosa alone is involved, it is wiser to spare the genital organs from the exposure, by radiating merely the abdomen front and back, excluding the small pelvis. Exploratory laparotomies are of great advantage in protecting the ovary which one desires to keep functioning, even when the adnexa are involved.—*Strahlentherapie für Peritonealtuberkulose S. Stephan, Monatschr. f. Geburtsh., u. Gynäkol., May, 1921, liv, 314.*

X-Ray Treatment of Peritoneal and Genital Tuberculosis.—Six cases are reported from the Greifswald clinic as completely healed. Peritoneal cases with tumor formation, but without ascites, and those in which there is marked cachexia are especially suitable. Operation, together with X-ray treatment, is indicated in the ascitic-miliary form. The same indications hold good when there is a combination of peritoneal and genital tuberculosis. Even the severe forms of genital disease with large pus foci are rayed.—*Zur Röntgenbehandlung der Bauchfell- und Genitaltuberkulose, S. Stephan, Strahlentherapie, 1920, x, 957.*

Heliotherapy in German Sanatoria.—This booklet is published as a result of questionnaires sent to the various sanatoria of Germany. It summarizes the cumulative evidence in regard to the value of sunlight, artificial light, the air bath, the X-ray and the incandescent light in the treatment of tuberculosis. In addition to this, the treatment of chronic otitis media with artificial sunlight, the combined use of quartz light and the X-ray, and the specific results of ultraviolet radiation in the Institute of Lostau are taken up in detail. With sunlight, Rollier's technique of graduated exposure, and the opinion of many workers in regard to the particular indications for this mode of treatment, are given. With artificial light, the many lamps used abroad are considered from the standpoint of employment of the individual parts of the spectrum. The results at Lostau together with many theories of the manner in which light accomplishes results are considered with particular reference to the value of pigment, but no uniform conclusion can be drawn. The effect of the mercury quartz

light on the body physiology is also considered, offering many contradictory viewpoints.—*Die Lichtbehandlung (Heliotherapie) in den deutschen Lungenheilanstalten, G. Liebe, Beitr. z. Klin. d. Tuberk., 1919, Supplement Band, viii.*

Light, Skin and Tuberculosis.—The writer is particularly interested in placing light as a therapeutic agent upon a strictly scientific basis; but the results thus far are not as good as the effort would seem to deserve. When one refers to light, only the ultraviolet spectrum is meant in many cases. The ultraviolets that penetrate through the upper layers of the skin are almost always absorbed in the basal cells. The inner organs are affected indirectly by means of the action on the basal cells. The theory is offered that light returns to the skin its natural properties. It protects the skin that is otherwise anemic and substitutes a physiological hyperemia. Tuberculosis is influenced indirectly and not in any specific way. General improvement occurs indirectly through the stimulation of the inner secretory functions of the basal cells.—*Licht, Haut, Tuberkulose, H. Jesionek, Fortschr. d. Med., 1920, no. 11, 213.*

Light and Climatic Treatment of Tuberculosis.—The specific action of light treatment depends on ultraviolet rays which are present in much smaller numbers in the lowlands than in either highlands or in artificial sunlight. This is so for general as well as for local radiations. The best rays for a strong irritation to affect sluggish wounds are the short ultraviolets, below 300 millimicra, which are particularly present in the ultraviolet lamp. The best rays to produce hyperemia are the more penetrating ultraviolets above 300 $\mu\mu$ in combination with the warm rays that are present in sunlight and in various lamps. It is important to interrupt the treatment at times to prevent the skin from becoming accustomed to the light. Change of climate is at times also important.—*Zur natürlichen und künstlchen Sonnen- und Klimabehandlung der Tuberkulose, H. Bach, Deutsche med. Wchnschr., 1920, xlviii, 795.*

Chaulmoogra Oil in the Treatment of Tuberculosis.—The similarity in morphology and staining characteristics of leprosy bacilli and tubercle bacilli, and the specific action of chaulmoogra and its related oils on the acid-fast group of bacteria, furnish a scientific basis for using them in the treatment of tuberculosis. The acid fractions of chaulmoogra oil, obtained by the method of Hollmann and Dean and modified by Aldrich, were used in the following experiments. Forty-eight guinea pigs were divided into 5 groups: (1) 12 pigs were inoculated with human type tubercle bacilli and left without further treatment as tuberculous controls; (2) 12 pigs were similarily inoculated and divided into groups of 3 each, which were given intraperitoneal doses of the acid sodium salts of the four fractions, A, B, C and D, of acids of chaulmoogra oil; (3) 8 pigs were left as entirely untreated controls; (4) 12 nontuberculous pigs received the same treatment as the tuberculous pigs of group two; (5) 4 pigs received increasing amounts of the A, B, C, and D fractions in a toxicity test. This report is described as preliminary; but the following findings are given: One per cent solutions of the acid sodium salts of the four fractions are least irritating and are readily absorbed from the peritoneum. No pathological findings could be attributed to the drug. On the other hand it seemed to cause an increase in weight. A bactericidal action on tubercle bacilli in 1:10,000 dilution was found. Of the 12 pigs inoculated with tuberculosis and not treated all died except one. Of the 12 treated tuberculous pigs only one died of the disease. The others were killed for comparison, one whenever a tuberculous nontreated pig died. A marked difference in pathological findings was observed, the advantage being in favor of the treated pigs. Treated pigs showed an average gain of weight of 49 gms. over the ones not treated. —*Chaulmoogra Oil in the Treatment of Tuberculosis, W. S. Culpepper and Marjorie Ableson, J. Lab. & Clin. Med., May, 1921, vi, 415.*

Tuberculin in Epilepsy.—Epilepsy is considered by some a contraindication to the administration of tuberculin. Crocket's experience shows, however, that it is a decided indication, especially in the presence of an active or quiescent tuberculous lesion, and when there is a family history of tuberculosis. He began to give tuberculin six and a half years ago to a patient thirty-two years of age, who had suffered from epilepsy of the major type since the age of seven, and who had a large mass of tuberculous lymph nodes below the right ear with several discharging sinuses. In the course of a year and a half the glands disappeared entirely. With the disappearance of the tuberculous lesions, the epileptic fits became fewer, and after two and a half years ceased entirely, and the patient also improved mentally. For four years this patient has been free from both tuberculosis and epilepsy. About eighteen months ago the author began to administer tuberculin

to several other epileptics who had no clinically obvious tuberculosis, but gave a family history. One of these responded very well. Tuberculin was first given to him in November, 1919. For nearly fourteen months he has had no signs of epilepsy and has also improvd mentally. Five others to whom tuberculin has been given for six to twelve months show a diminution in the number and severity of their seizures. Three show no change. General reactions have been avoided, but once or twice local reactions of a rather severe type occurred when large doses of bacillary emulsion were given. On two occasions cold abscesses formed, which had to be aspirated.—*Tuberculin in Epilepsy, J. Crocket, Brit. M. J., March 26, 1921, no. 3143, 458.*

Tuberculosis of Tonsils.—*Conclusions*: 1. The systematic search of a limited number of microscopic sections, so orientated as to show in each the entire surface of a vertically bisected tonsil, is the only practicable routine method for detecting tonsil tuberculosis. 2. The incidence of active tonsil tuberculosis in a series of 8697 consecutive cases was found to be 2.35 per cent. This minimum figure would have been increased by an unknown, but probably small, amount if it had been possible to examine all portions of each tonsil. 3. The incidence in respect to sex shows tonsil tuberculosis to be slightly more common in females than in males at practically all ages. 4. In the series of 204 positive cases here reported, the range of ages was from two to fifty-nine years. The incidence in various age groups depends largely on the character of the population from which the material is derived, the incidence being particularly high in institutions for the care of children and among medical students, internes and nurses. 5. Tonsil tuberculosis may be divided into three types: focal crypt infections, ulcerative lupus-like lesions and diffuse miliary tuberculosis. 6. The crypt infection is the most common type, is usually unilateral, involves one or more crypt areas only, and avoids the lymph follicles. Some of these cases are autoinfections in open respiratory tract tuberculosis but the majority must be considered cases of primary focal tonsil tuberculosis. 7. The ulcerative lupus-like lesions result from the coalescence of crypt infections at the mouths of crypts or from direct extension from neighboring surfaces. 8. The diffuse miliary tuberculosis is usually a bilateral, or, if the pharyngeal tonsil is examined, a universal tonsil lesion. The tubercles are widely scattered and occur almost exclusively in the follicles and germ centres. This type can best be explained as a hematogenous miliary dissemination. 9. Mixed types occur as in patients with open pulmonary tuberculosis, in which autoinfection may be associated with hematogenous miliary tuberculosis, giving a combination of crypt infections with diffuse miliary tubercles.—*The Incidence and Histopathology of Tuberculosis of the Tonsils, C. V. Weller, Arch. Int. Med., June, 1921, xxvii, 631.*

Laryngopulmonary Tuberculosis.—Tuberculosis of the larynx is always secondary to tubeculosis of the lungs or lymph nodes. For this reason the prognosis is grave. In those cases where the trouble in the larynx has been cured by local treatment, the pulmonary lesion was either slight or inactive. Laryngeal tuberculosis should be spoken of and treated as laryngopulmonary tuberculosis. Except in the cases where the pulmonary lesion is inactive or distressing symptoms must be relieved, patients should not be treated in the office or clinic. Tuberculosis of the larynx is almost invariably found among tuberculous adults, and occurs in about 25 per cent of the patients. It is present only in those cases which have, or have had, a positive sputum. Usually there is a predisposing cause, such as nasal obstruction, chronic pharyngitis, tonsillitis, catarrhal laryngitis, history of excessive cough, excessive use of tobacco and alcohol, and lues. The infection is caused directly by the tubercle bacilli implanted on the mucous membrane of the larynx. In almost every case there is an open pulmonary lesion which means a constant stream flowing over and bathing the laryngeal mucosa. There are three types of laryngeal tuberculosis: acute, subacute, and chronic. The acute type is characterized by a soft edema of the larynx with a marked tendency to ulceration. The patient usually suffers from hoarseness, a sensation of fulness in the throat and irritation with a constant desire to cough and expectorate. Dysphagia may be pronounced. With the patient in good general condition, the disease may run its course, become subacute and occasionally arrested, but in general the lesion is hardly amenable to treatment. The patient, as a rule, dies in from six to eighteen months. The subacute type is characterized by a pseudo-edema of part or parts of the larynx with a moderate tendency to fibrosis. Hoarseness and dryness in the larynx are the symptoms complained of; and the patient is usually benefited by treatment. The prognosis is favorable when the general condition of the patient is good and an early diagnosis of the disease has been made.

The chronic type gives the best prognosis and is characterized by firm infiltration of part or parts of the larynx with a marked tendency to fibrosis and healing. The larynx should be examined in every tuberculous individual, so that early involvement may be discovered. Examination of the respiratory tract should begin with the nasal chambers. In making a diagnosis care must be used to distinguish between bronchiectasis, accessory sinusitis, laryngitis sicca, and lupus. In the chronic cases the voice may remain affected while the prognosis for life is good. Patients with the most extensive lesions do not give the poorest prognosis. It is not so much the extent as the character of the lesion that determines the gravity of the individual case. Temperature, pulse and weight constitute the keynote to the patient's general condition. Underlying disease, such as syphilis, aggravates the prognosis by lowering the general vitality of the patient. The economic condition is an important factor. Ample financial resources are necessary to cover an average period of three to five years. The patient of independent means, who is faithful to treatment, offers a better prognosis than one who must earn his livelihood or return to work after a brief course of treatment. Prognosis as to voice is more definite. It depends upon the extent, location and character of the local lesion. Cases with involvement of the true cords and interarytenoid space give a poorer prognosis than if situated elsewhere in the larynx. Treatment is general, prophylactic and local. The lungs should first receive attention and absolute rest in bed must be insisted upon, before any attempt is made to treat the larynx. Outdoor sleeping should be urged and a generous diet prescribed. Predisposing factors, capable of producing a catarrhal condition of the larynx, are to be removed. Rest of the voice is imperative. For relief of pain, orthoform or cocaine before meals may be given. Epiglottidectomy is sometimes necessary, and always indicated where the lesion is limited to the epiglottis and the patient's condition permits.—*Laryngopulmonary Tuberculosis, J. Dworetzky, Med. Rec., July 9, 1921, c, 57.*

Nerve Block in Laryngeal Tuberculosis.—The successful injection of an anesthetic solution into the sheath and substance of the internal laryngeal nerve produces a block anesthesia of the areas supplied by the terminal filaments of the nerve. This procedure is easily carried out. The pain secondary to injection is accentuated for a few seconds, after which much relief is experienced. The block anesthesia lasts for a period of at least ten days and is complete. When the injection has been made in the tissue around the nerve, then only an imperfect anesthesia is obtained, of a maximum duration of four or five days. After nerve block any local procedure is carried out with greater ease. The patient can swallow and speak with a clearer voice. It is surprising to see how much weight an emaciated tuberculous indivdual may gain after ten days anesthesia of the larynx. Nerve block of the internal laryngeal nerve, topical applications of cleansing solutions and of formaldehyde in increasing strength, the judicious use of tuberculin, and general hygienic measures will contribute to marked improvement and alleviation of symptoms.—*Block Anesthesia of the Internal Laryngeal Nerve, A. Wallace, Southwest. Med., July, 1921, v, 16.*

Nontuberculous Enlargement of the Bronchial Lymph Nodes.—Gähwyler calls attention to seven cases in which the roentgen ray and all the physical findings point to tuberculous disease of the bronchial nodes, with pains between the scapulae, and ready fatigue, etc. But the persisting good general health and other features of the cases seem to disprove absolutely a tuberculous affection, and tuberculin tests have been constantly negative for years. The patients are five children between six and sixteen, a woman of thirty-five, and a physician of thirty-eight. Nageli's figures as to the prevalence of tuberculosis need revision, as he classified as tuberculous all calcified nodes found in cadavers. The roentgen ray findings are unable to differentiate tuberculous from nontuberculous calcification.—*Über nicht-tuberkulöse Bronchialdrüsenschwellungen und Verkalkungen, M. Gähwyler, Schweiz. Med. Wchnsckr. April 7, 1921, 317.*

The Heart and Tuberculosis.—*Summary;* An electrocardiographic study of 97 patients with pulmonary tuberculosis in the Montefiore Hospital (N. Y. City) revealed 29 per cent with right ventricular predominance, 30 per cent with left ventricular predominance, and 41 per cent with no predominance of either chamber. Right ventricular predominance is not always associated with any particular type of tuberculosis. It is found more commonly in young than in old patients, and twice as frequently in men as in women. Left ventricular predominance is not always associated with any particular type of tuberculosis. It is found more commonly in older patients and is twice as frequent in women as in men. Left ventricular predominan

occurs more frequently with the increasing age of the patient. In contrast to the necropsy findings reported in the literature, right ventricular predominance is not found more frequently in association with fibroid phthisis, or with pleural adhesions, than with other types of pulmonary tuberculosis.—*The Right Ventricle in Pulmonary Tuberculosis, E. P. Boas and H. Mann, Arch. Int. Med., July 15, 1921, xxviii, 62.*

A Case of Tuberculous Mesenteric Nodes.—Apropos of two cases of tuberculosis of mesenteric lymph nodes recently reported by H. N. Clute, the writer reports a similar case. The patient was a male, aged twenty-seven, laborer, whose chief complaint was abdominal pain and vomiting. The family history was negative, and the past history negative except for influenza-pneumonia one year before. Attacks of epigastric pain accompanied by nausea and vomiting had been present for eight months. Physical examination revealed a firm nodular tumor, the size of a hen's egg, in the left upper quadrant, to the left and above the umbilicus; and a smaller freely movable one just at the right of the larger mass. The temperature and pulse remained normal. The white blood count was 12,000. X-ray of the lungs showed marked increase in density and mottling in both apices. On operation, a large firm mass of mesenteric nodes in the region of the transverse colon was found. The mesentery was studded throughout with enlarged nodes. No attempt at removal was made. From the location of the tumor and its fixation a pancreatic tumor of some kind had been diagnosed.—*A Further Case of Tuberculous Mesenteric Glands, J. M. Lynch, Boston M. & S. J., April 14, 1921, clxxxiv, 384.*

Bone Tuberculosis.—Material, collected during the treatment of 50 cases of bone tuberculosis, was studied from a clinical standpoint. The cases presented various types of the manifestations usually associated with infectious bone lesions. The symptoms and physical data established the tubercle bacillus as the etiological factor without great difficulty. In some cases, diagnosis of tuberculosis was not made certain until the material obtained at operation was sectioned and studied microscopically, and animal inoculation had confirmed it. The pathological process was not found to be essentially different, wherever it may occur. If tissues are involved that possess the property of rapid proliferation when infected, this process will be observed when the tubercle bacillus is the agent; but if tissues are involved which do not rapidly proliferate destruction will occur. The tuberculous process, as it affects bones and joints, is one and the same; variations are due only to the characteristics of the tissue infected. But it is unwarranted to classify this disease according to the type of reaction observed. Such terms as infiltrating, atrophic, caseous and hypertrophic tuberculosis of the bone, or chronic synovial tuberculosis, and fungating or granulating tuberculous synovitis, are not apt. This series of 50 cases points to the fact that the disease is primarily osseous.—*Tuberculosis of Bone: Results of a Study, N. Allison, Arch. Surg., May, 1921, ii, 593.*

Tuberculous Hip Disease and Its Simulants.—In the Frediksvern (Norway) Coast Hospital, in the period from August, 1903, to June 30, 1918, 252 skiagrams of the hip joint were made. Every case showing destructive processes of the joint, with or without suppuration, was regarded as tuberculous, unless proved otherwise by tuberculin test or pathological examination. In 19 of the 262 cases, signs of disease were lacking or were so slight that a definite diagnosis was impossible. Of the 243 positively diagnosed cases, 171 were tuberculous, leaving 29.6 per cent nontuberculous. The percentage of nontuberculous hip affections is still further decreased if only the seven year period of July 1, 1911, to June 30, 1918, is considered, during which the author personally investigated and treated every case. During this period 613 cases were admitted with a diagnosis of tuberculosis of the hip, but this diagnosis was confirmed in only 64 cases, the proportion of nontuberculous cases being 43.4 per cent. Most of the nontuberculous cases in both groups were diagnosed as Calvé-Perthe's disease. In 13 of the cases it was impossible to establish a diagnosis even after reëxamination. In 12 of them tuberculosis could be definitely excluded; in the one remaining case there was a history of tuberculosis of the elbow, but the X-ray examination of the hip was negative, and treatment caused no change in either the clinical signs or the X-ray picture. The child remained in good general health, the only symptoms of hip disease being atrophy of the gluteal muscles and a marked limp. When the cutaneous test is positive, signs of hip disease, however slight, call for treatment for tuberculosis until the X-ray picture or the subsequent course of the disease definitely excludes the diagnosis. *Conclusions:* 1. Tuberculosis of the hip is less common than was once supposed. 2. All statistics dealing with the results of treatment of this

disease up to the present time are worthless. 3. If most of the benign cases be excluded from these statistics, the prognosis for true tuberculosis of the hip will be found to be far worse than was formerly supposed. 4. In spite of modern diagnostic methods, it is impossible in about 10 per cent of all cases of hip disease to establish a diagnosis.—*Tuberculous Hip Disease and Its Simulants, H. Sundt, Tubercle, April 1921, ii, 289.*

Tuberculosis of Knee Joint.—Knee joint tuberculosis constitutes about 20 to 25 per cent of all cases of joint tuberculosis. The disease may be primary in either the synovia or the bone. Shaft tuberculosis is rare. Knee joint tuberculosis must be differentiated from chronic synovitis due to sprains, trauma or infection as well as from syphilitic joint affections, sarcoma, carcinoma, etc. In children there is a more marked resistance to the disease and reparative processes are much more active than in adults. For this reason, conservative treatment such as rest and immobilization are indicated in children. Operative procedure hastens and insures a cure and is therefore indicated in adults. The operation is that of resection of the knee. The author follows the technique of R. H. Hibbs, in that only the cartilages of the articulating surfaces of the femur and tibia are removed. There is no attempt to excise or remove the capsule. The patella is excised subperiosteally and placed in a bed chiselled out in the femur and tibia, thus both fixing the bones and acting as a bone graft. Then the joint is immobilized in a plaster cast for three months, by which time firm union is to be expected.—*Treatment of Tuberculosis of the Knee Joint, J. J. Kurlander, Ohio State M. J., January, 1921, xviii, 20.*

Tuberculosis of the Skin.—Lupus vulgaris, or true tuberculosis of the skin, may be the sequel of inoculation from within or from without. If from within, the lesions are apt to be widespread; if from without, localized. Often they are adjacent to a focus of visceral tuberculosis and show evidence of extension by contiguity. Tubercle formation is the essential feature, with subsequent caseation, necrosis, and attempted healing. If the organism is of low virulence and the tendency to heal is marked, the tuberculous lesion is nonulcerative and involutes, leaving a thin papery scar. If the virulence is considerable and the resistance low, an ulcerative lesion develops which may produce extensive destruction, especially when it occurs about the mucocutaneous borders. The scar of lupus vulgaris is markedly contractile, apt to be tough and banded, and usually produces distortion. Inoculation tuberculosis of the skin is most familiar in the form of tuberculosis verrucosa cutis, the warty papule or plaque with a rough, horny surface and an erythematous areola. Lesions of this type usually occur on surfaces exposed to trauma and are not uncommon about the finger nails. There is a type of inoculation tuberculosis which produces, at the site of inoculation, a trivial reaction in the form of a dozen or more tubercles, sometimes with a slight tendency to ulceration and prompt central healing. The infection quickly metastasizes to the regional lymph nodes, producing there an immediate suppurative reaction with sinus formation. By the time the regional lymphatic process is fully developed the original focus may have all but disappeared. Lupus erythematosus is classed under tuberculosis of the skin, but is not a true tuberculosis, though associated with it. It is characterized by an inflammation of the follicles with the formation of adherent conical, horny plugs. The coalescence of these hyperkeratotic plugs forms the adherent scale. The sequel of the follicular inflammation is the atrophy so characteristic of the disease. Erythematous lupus about the face and in the scalp is most disfiguring, although it is seldom a serious condition. When it appears on the hands it must be regarded as a transition towards the grave and often fatal toxic form of lupus erythematosus disseminatus. Ordinary cases have been known to respond to the administration of tuberculin by developing the fulminating disseminated type with hyperpyrexia and death. For that reason tuberculin should not be used in the diagnosis or treatment of lupus erythematosus. Treatment in any form is unsatisfactory. The use of the X-ray or radium on either lupus vulgaris or lupus erythematosus is to be discountenanced, because of the grave risk of rapid malignant degeneration. Transitions from erythematous lupus into the sarcoids are not infrequent. Lichen scrofulosorum belongs, in all probability, to the toxic manifestations in the skin produced by visceral tuberculosis. The essential lesion is follicular, a pale yellow papule forming about the mouth of the hair follicle, and a spinous plug usually appearing in the mouth of the follicle. These lesions are grouped into patches, the gross appearance suggesting goose flesh. In papulonecrotic tuberculids the essential lesion is a papule, inflammatory in character, which within a few hours of its appearance develops a central vesicle or softening, associated with a necrosis of the involved

tissues. This central necrosis dries down to form a hard, dark, conical, plug. When this plug is detached in the process of healing a scar persists. Papulonecrotic lesions may occur on any part of the body. The association of papulonecrotic tuberculids with foci of tuberculosis is practically beyond dispute. An equally interesting association of these lesions is that with foci of septic infection. Rheumatism and tonsilitis run parallel with pneumonia and influenza in the symptomatic background of tuberculids. In the treatment of papulonecrotic tuberculids arsphenamin has given satisfactory results. A low or diminished resistance is a distinct contraindication to the use of the drug.—*Tuberculosis of the Skin in Some of Its General Medical Aspects, J. H. Stokes, Northwest Med., April, 1921, xx, 79.*

Is Lupus Erythematosus Due to Tuberculosis?—The question of the relationship of lupus erythematosus to tuberculosis was studied by estimating the percentage of clinical tuberculosis detected in patients with lupus erythematosus discoides; by searching for signs of tuberculosis in the records of patients with dermatoses ordinarily not associated with tuberculosis; by comparing the frequency of clinical tuberculosis in such dermatoses as erythema multiforme and erythema nodosum, with the incidence of tuberculosis in lupus erythematosus discoides chronicus; and by comparing the incidence of tuberculosis in the records of patients with tuberculids, with the frequency of tuberculosis in patients with lupus erythematosus discoides chronicus. It was found that that the incidence of clinical tuberculosis in dermatoses admittedly of nontuberculous origin (38.1 per cent) is approximately as high as in lupus erythematosus discoides chronicus (35.7 per cent). Clinical tuberculosis is no more frequent in dermatoses like erythema multiforme and erythema nodosum (32 per cent) than in lupus erythematosus discoides chronicus (35.7 per cent.) The frequency of clinical tuberculosis in patients with tuberculids (84 per cent) presents a striking contrast if compared with its frequency in lupus erythematosus discoides chronicus (35.7 per cent). The two lesions, therefore, cannot have the same pathogenesis. The tuberculous origin of lupus erythematosus discoides chronicus has not been proved by experimental work. Clinical observations, including this statistical study, seem to favor various etiological factors.—*Is Lupus Erythematosus Discoides Chronicus Due to Tuberculosis?—W. H. Goeckerman, Arch. Dermatol. & Syphilol., June 15, 1921, iii, 788.*

Chronic Nontuberculous Lung Disease.—In a recent article by Greeley and Brereton, an account was given of investigations into the bacteriology of the sputa of some thirty cases of chronic nontuberculous lung disease. They devised a medium (lactic acid-agar) which would act selectively in the cultivation of moulds. Upon this plants were made from various specimens, and cultures incubated at both body and summer (70°–80° F.) temperatures. It was found that the sputa of 14 of the cases contained the penicillium glaucum; 2 the mucor corymbifer; 1 the aspergillus fumigatus; while those of 13 cases gave (on culture) only yeast forms. Of the 30 some cases, 6 showed physical signs of lung infiltration. Six of these cases had been classed by their medical attendants as chronic bronchitis, 2 as acute bronchitis and 3 as bronchial asthma. The diagnosis of chronic nontuberculous lung disease was made, in the cases in question, as the result of numerous recorded sputum examinations for tubercle bacilli, which had resulted negatively; and by the finding of organisms (fungi) known to be capable of producing such lesions. After making a diagnosis of nontuberculous fungoid lung disease, treatment is greatly facilitated, since one is then free to push medication, as by the iodides, a procedure which would be dangerous in tuberculous lung disease. Besides this, autogenous vaccines may prove beneficial. Some idea of the effect of such vaccines can be had by reading the detailed report of 4 cases. A vaccine is only a stimulant to the natural curative powers and therefore results depend, not upon the injected material, but upon that which may be produced in response to its action. One must look to the reactions which follow an injection for indication that such production is under way, and the size of doses and intervals between them must be regulated according to the effects of previous injections. In such conditions as are under consideration it is suggested to start with a dose of 500 million organisms, and then at the end of three days consider the size and time of the next dose. If a distinct local reaction, with definite swelling and redness, follows the injection, this evidence of the desired stimulation renders it unnecessary to increase the dose at all, or certainly to not over 10 per cent. Reinjections should never be made until twenty-four hours after the subsidence of all reaction. This usually brings them around every three days; and the same interval had better be allowed when there is no reaction. Noticeable focal reactions (heaviness over the chest, increased or diminished cough and expectoration) and even constitutional manifestations,

such as elevation of temperature, may occur, and indicate a maximum stimulation. Such reactions had better be followed by reduction in doses. In case no reaction is elicited, the next dose should be increased 25 per cent, and so on. In case a patient persistently fails to react, say, after the initial dose of 500 million has been increased tenfold, the administration of potassium or sodium iodide, to the extent of 15 to 30 grains a day, may be tried together with the vaccine, since it seems that iodine arouses the reactive mechanism. It is claimed that good results may follow vaccine treatment without noticeable reaction, but cases showing the latter certainly make the greatest improvement.—*Chronic Nontuberculous Lung Disease, H. Greeley, Med. Rec., July 16, 1921, c, 99.*

Bronchiectasis and Accessory Sinus Disease.—Patients with chronic bronchitis and bronchiectasis have often been classed as tuberculous and placed in tuberculosis institutions both before and since the war. They usually have a chronic cough with profuse expectoration, but without tubercle bacilli. If their noses and accessory sinuses were examined, these would frequently be found to be the seat of chronic suppuration. Appropriate local treatment benefits the chest condition. The authors advocate routine examination of the upper air passages in every such case and report three illustrative instances out of a series of thirty-eight.—*Bronchiectasis and Bronchitis Associated with Accessory Sinus Disease, G. B. Webb and G. B. Gilbert, J. Am. M. Ass., March 12, 1921, lxxvi, 714.*

Tropical Bronchopulmonary Mycosis.—The cases came to necropsy as the result of some intercurrent medical or other accident. Cultures from many lungs were taken in order to obtain a pathological picture, the result of a pure mycotic infection. On cut sections, the lungs resemble very much a tubercle infection. Although the blood supply is completely cut off from these filbert-like growths, yet there seems to be no necrosis, and it is possible that the surrounding tissues indirectly supply nourishment. As many different specimens have been examined without finding any lungs in which necrosis has taken place, it would seem that the fungi, at least those found in Siam, have in the beginning a stimulating effect on the tissue cells. In view of the fact that mixed infections of long standing present on postmortem examination the same firm connective tissue tumors, it is doubtful whether these growths, except under the most adverse conditions, break down. The acute cases as well as the chronic may be mild or severe, but the average case presents signs and symptoms not at all unlike those of an acute bronchitis. There is some fever, irritating cough, expectoration of large amounts of mucous or mucopurulent sputum and a general sensation of illness. The chronic cases, on the other hand, are to be differentiated from tuberculosis and spirochetosis. The symptomatology of an average chronic mycotic lung infection produces all of the signs and symptoms of a tubercle infection even to true hemoptysis, which would tend to show that these mycotic tumors do, under favorable conditions, break down and degenerate. A diagnosis can be made only after laboratory examinations. The prognosis and treatment of the chronic cases is not unlike that in tuberculosis. From a public health point of view the only difference between tuberculosis of the lungs and bronchopulmonary mycosis is one of degree. They are both contracted in the same way. They are both incapacitating, and are both preventable. It is not improbable that many cases of supposed tuberculosis of the lungs, especially in some of the southern states of the United States, would on careful bacterial examination prove to be cases of bronchopulmonary mycosis.—*Tropical Bronchopulmonary Mycosis, R. W. Mendelson, J. Am. M. Ass., July 9, 1921, lxxvii, 110.*

Epidemiology of Tuberculosis.—Opinion concerning the epidemiology of tuberculous diseases has changed enormously within the last decade. Bushnell states that there is a fundamental distinction between the epidemiological behavior of tuberculosis recently exposed to infection and amongst populations wherein the disease has prevailed for generations. Amongst acclimated races the mortality of tuberculosis varies with the hygienic conditions and social status. Any attempt to eliminate sources of infection in settled countries would be positively injurious, as the danger of a chronic and usually relatively benign infection would be exchanged for the danger of an acutely fatal one. Either physical, occupational selection, hygienic conditions of labor, or opportunity for massive infection, are important factors in etiology and must be called upon to explain the difference in mortality in the different industries.—*The Epidemiology of Tuberculosis, Editorial, Brit. M. J., April 16, 1921, no. 3146, 570.*

Congress of the German Society for Internal Medicine.—This, the thirty-third, congress of the society was held at

Wiesbaden, April 18–21, 1921. A symposium on the treatment of pulmonary tuberculosis formed the topic of the first day's discussion. Aschoff spoke on the natural healing tendencies in phthisis. He used the clinical term phthisis advisedly, whereas the clinicians clung to the old anatomical nomenclature. Uhlenhuth discussed the experimental basis of tuberculosis therapy. Animal experiments intended to prove the prophylactic and curative value of tuberculins, including the Deycke-Much preparation, have not stood the test of time. In man, tuberculin has achieved incontestable results. But these are not due to any antitoxic or antibacterial action, but to local hyperemia. It is an established fact that childhood infection imparts partial immunity. The bacillus should be the object of future therapeutic research. Chemotherapy may also hold out hope. Gerhardt and de la Camp spoke on bedside and X-ray treatment respectively. X-rays should be used only in cases tending to fibrosis. Only in minimal doses do they stimulate connective tissue formation. Brauer discussed the operative treatment with which his name is so intimately associated. In the general discussion, twenty men illuminated the present status of phthisiotherapy. Nothing new was brought out. With a strictly critical sense and apparently a feeling of resignation, the speakers concluded that we have not progressed much further in treatment than in the days of Brehmer and Dettweiler.—*Summarized by Prof. H. Kohn, Berl. klin. Wchnschr., April 25, 1921, no. 17, 435.*

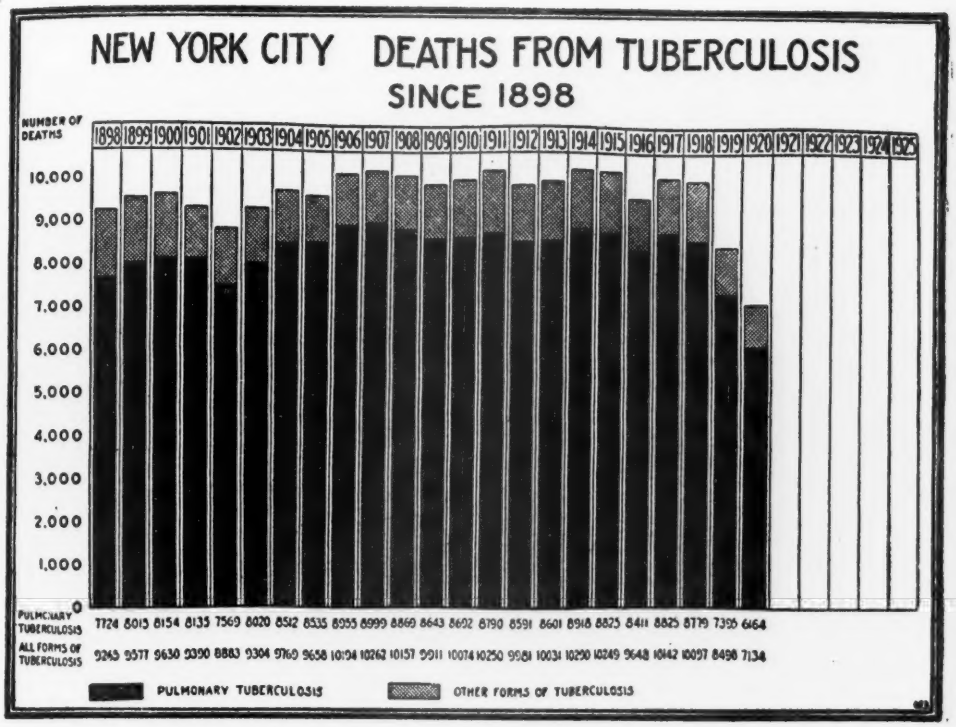
Tuberculosis: Retrospect and Prospect.—It may not be without interest to look back ten years and as best we can reconstruct our old modes of thought about tuberculosis, compare them with views to-day, and, perhaps even try to guess at some changes which to-morrow may bring. Of the many teachers in tuberculosis in the past ten years, three have been the greatest. The first was the world war. War demanded the closest diagnosis and taught that the unfit should not be made to serve, nor the fit allowed to escape service; that the unfit after the war should be properly cared for and the fit not allowed to remain a burden on the country. The second teacher was pestilence, influenza, and its lessons are as yet by no means all learned. Concerning the interrelation between influenza and tuberculosis in etiology and in differential diagnosis, the last word has certainly not yet been spoken. The third chief teacher has been the roentgen ray, which not only aids in diagnosis but also in illuminating pathology. The employment of surgical and nonsurgical methods of treatment represents a great advance. Artificial pneumothorax was thought out a century ago, and used a third of a century ago; yet it came into general use, in America at least, only within the past ten years. In 10 per cent of cases to which it is applicable, it increases the chance of improvement by possibly 50 per cent. Ten years ago Paterson's autoinoculation ideas had some vogue, though few followed him far in his cure by work. The two sides of the shield, rest and exercise, are alternately exhibited. Just now rest seems to be in the ascendancy, and we have rest squads, where ten years ago we had work gangs. While we all see the need of both rest and exercise, the opinion is stronger than ever that the essence of the cure to be applied early and long is rest. Food ideas have not changed much, but we have got a little further away from the fad of overfeeding and the raw egg, which was always disliked, and is now abandoned on scientific grounds. What the next ten years may bring forth no prophet can say, but means may be found for making an earlier diagnosis.—*Retrospect and Prospect: Tuberculosis Ten Years Ago, To-day and To-morrow, David A. Stewart, pamphlet, 1920.*

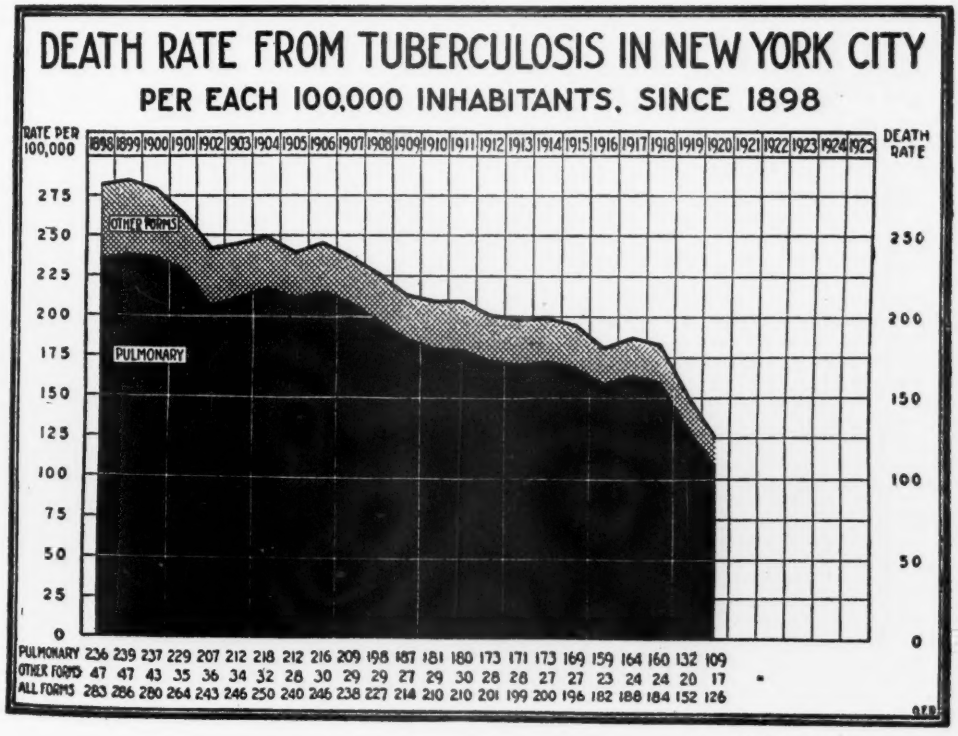
Some Questions Relating to Tuberculosis.—Although to some practitioners the subject of tuberculosis does not arouse enthusiastic interest, the problems are serious and many feel that there is yet much to be learned; and since it is contended that some pulmonary lesions present signs and symptoms practically identical with those resulting from the invasion of the bacillus of tuberculosis, the articles prepared by Dr. Hawes are stimulating and to some will be found to be encouraging. The first paper on this subject appears in this issue of the Journal. In connection with this subject, the recent veterinarian conference in Boston was notable because the etiological relations of bovine to the human disease are given prominent consideration. It is evident that veterinary medicine is alive to the importance of controlling bovine tuberculosis as it enters into the human problem, as well as its relation to economics. Dr. E. C. Schroeder, of the United States Bureau of Animal Industry, contended that *bovine tuberculosis can be eradicated* by a broad public policy of the general application of the tuberculin test and destruction of diseased animals. Already bovine tuberculosis has been reduced 20 per cent. in the past five years, and many pure bred herds are entirely free. Dr. John F. Devine,

of Goshen, N. H., stated that "we can never eradicate human tuberculosis while we nourish it with the bovine." Breeders with the largest interests are endorsing radical measures, but the difficulty lies in dealing with small herds, for the loss of cattle is a severe tax on the man of limited means. In order to meet this objection the government must provide for an adequate indemnity. Considerable notice has been taken by the press of the views of Dr. Maurice Fishberg, expressed during the meetings of National Tuberculous Association, relating to marriage by those afflicted with the chronic form of tuberculosis. It is generally believed that such patients should not be given any general instructions in regard to important details of life or treatment, especially in daily papers, but rather have every feature of a case passed upon by a physician who is competent to decide such questions. The general publication of opinions of this sort may do great harm and lead to mental distress, for it is perfectly well known that although a pregnant woman may appear to be doing well, after parturition the disease sometimes develops very much more rapidly. If the statement had been published in a more conservative way, with instructions to always submit the question to a capable physician, less harm would have resulted. It has become the fashion to publish as much medical matter in the daily press as the editors feel may be of interest and can be made spectacular. It would be of advantage if such matter could be supervised by one with a judicial mind trained in medicine. Another matter reported among the subjects discussed by the American Institute of Homoeopathy relating to tuberculosis may also be referred to in this connection. It was stated that alfalfa and clover had been found to be of value in treating the disease. Two generations ago clover was in use among the laity as a cure for cancer, and while we all hope that more effective methods of treatment will be discovered, history should lead to careful investigation and rigid scrutiny of any drug treatment before it is made public. The people have suffered so many disappointments that we should feel that premature proclamations should not be made. The recent article by Dr. Hawes on the treatment, since given publicity in England, is very pertinent.—*Editorial, Boston M. & S. J., July 7, 1921, clxxxv, 35.*

Cure or Preventive of Tuberculosis.—The characteristics of the human, bovine and avian types of tuberculosis are described and discussed. The author concludes from his recent discussions with many of the English and French leaders, and from the recent English and French literature, that there is a spreading conviction that not much further progress will be made until a specific treatment is obtained for its cure or prevention, or both; that in all probability, this specific when found will be some living relation or modification of the tubercle bacillus; that the reason this specific has not been found before is that the tubercle bacillus has not been understood and is not understood; and that it behooves all the capable and ambitious who are engaged in tuberculosis work to study the tubercle bacillus, and to keep themselves informed of the studies of the tubercle bacillus made by their fellow workers in this and other lands.—*What About a Cure or Preventive of Tuberculosis? S. J. Maher, Med. Rec., May 7, 1921, xcix, 769.*

Pulmonary Tuberculosis Mortality Since 1914—The course of mortality from pulmonary tuberculosis during and since the world war exhibits variations of unusual interest. The data for 1919 and 1920 have not been completely tabulated but a table has been compiled giving the mortality rates per 100,000 living persons for the United States, England and Wales, the Dublin registration area, and Spain, by years, since 1914. From a study of this table is seen a definite rise in mortality, widespread and lasting through 1918, followed by a marked decline in 1919 and 1920. The high rate for 1918 was apparently due to the two waves of epidemic influenza. Presumably, many tuberculous persons were carried off by the influenza epidemic and a part of the low tuberculosis rate in 1919 and 1920 reasonably may be ascribed to the earlier removal of persons who would have died in these two years. Roughly discounting, however, the effect of the influenza epidemic, the existence of an unusual wave of mortality from pulmonary tuberculosis is still clearly shown, beginning in 1916, reaching its crest in 1917, and declining in 1918, 1919, and 1920. If there be an association between the economic conditions and the tuberculosis death rate, a possible explanation is suggested in the fact that immediately preceding the rise in mortality during 1914 and 1915 in the United States, there was a period of serious unemployment, and that in 1917–1920 wages kept pace with living costs and the demand for labor was extraordinarily great. Stevenson, in the 1919 Report of the Registrar-General, comments upon the course of tuberculosis mortality in England and Wales. He says it is remarkable that a fall in the





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mortality from tuberculosis occurred in 1919, notwithstanding the effects of the influenza epidemic which continued into the early part of the year. If the influenza increased the death rate by killing off tuberculous patients who would otherwise have died a little later, the great fall which has occurred since the end of the epidemic may be in part attributable to this earlier removal of tuberculous persons. There is no evidence that mortality from the nonpulmonary forms of the disease was increased by the epidemic. These nonpulmonary rates were very low in 1919, and this is thought to point to a real decline in the destructiveness of tuberculosis.—*The Course of Pulmonary Tuberculosis Mortality since 1914, Pub. Health Rep., May 27, 1921, xxxvi, 1178.*

Pulmonary Tuberculosis Mortality of Large U. S. Cities.—Denver heads the list, with a death rate of 281 per 100,000; Los Angeles next, with a rate of 154. It is not surprising that these two cities should head the list, as regards mortality from this cause, by reason of the well known fact that thousands of persons take up their abode in these cities, famous for the more or less ideal climatic conditions favorable to the cure or the arrest of this disease. Portland, Oregon, showed an extremely low rate of 54 per 100,000—that is, ½ of the mortality as found in Denver. Rochester had the extremely low rate of 64, closely followed by Milwaukee, with a rate of 70, and St. Paul, with a rate of 71. The 3 largest cities of the country, Chicago, New York and Philadelphia, showed rates of 83, 109, and 121, respectively. The rate for the city of Boston was the same as that for New York City.—*Mortality of the Large Cities of the United States for 1920, Weekly Bull. Dpt. of Health, N. Y. City, July 9, 1921, x, 217.*

Tuberculosis in a Parish.—As the problem of tuberculosis in rural districts is obviously different from that in industrial areas, a small country parish in the county of Carmarthen was chosen for intensive investigation for the following reasons: the parish is purely agricultural; it is situated at a high altitude, but differs in no respect from other parishes; there is no manufacturing town within twenty miles; and there are no industrial conditions, generally considered favorable to the onset or spread of tuberculosis. The general conclusions may be summarized as follows: 1. Just as the rural counties of Wales suffer from a higher mortality than industrial counties, this was also the case in the county of Carmarthen. 2. The inhabitants of the parish are insufficiently and unsuitably fed. The standard of diet is universally low among laborers and farmers alike. Alcoholism is infrequent. Infants are rarely breast-fed, condensed milk being largely used. 3. Domestic insanitation is rife and common to both tuberculous and nontuberculous population. 4. The intermarriage of tuberculous stocks is lamentably frequent, and has a marked effect in maintaining the present high death rate. 5. Structural deficiency in housing does not influence the heavy death rate as much as in urban districts. 6. The unhygienic mode of life found in this parish is partly a result of poverty, but to a greater extent to bad tradition, and therefore renders the tuberculosis problem all the more difficult to solve. 7. Resistance to infection with tuberculosis is remarkably low. Institutional treatment is rarely accepted and its results are disappointing. During the period 1875–1914, approximately one sixth of the total deaths were due to tuberculosis, 81 per cent. of the deaths from tuberculosis being due to the pulmonary form.—*Tuberculosis in a Welsh County Parish, R. C. Hutchinson, Tubercle, May, 1921, ii, 345.*

Tuberculous Disease In Life Insurance Selection.—Since tuberculous infection has taken place in over 90 per cent of the human race before the age of fifty it cannot enter into the calculation of life insurance risk. On the other hand, tuberlous disease represents one of the most serious problems with which the companies have to deal. The close association of tuberculous disease wtih other lung lesions and the marked effect of other diseases upon the development of tuberculosis present additional risks. A history of pleurisy, prior to the onset of pulmonary tuberculosis, is present in from 20 to 25 per cent of the cases. Inflammation of the pleura seems to be an expression on the part of nature to limit the progress of tuberculous infection. On account of the recent high incidence of influenza pneumonia, a great many chronic lung changes will be encountered in the next few years. These will unquestionably have an unfavorable influence upon mortality. Abnormal physical signs at one apex in these cases should be considered as due to pulmonary tuberculosis until proved otherwise. At no period in the last ten years, has the author had under observation so many unfavorable cases suffering from tuberculous disease as now. More than 50 per cent of these give a history of severe influenza or influenza pneumonia. Bronchitis may also mask an underlying tuberculous lesion.

Applicants with a history of bronchitis, or where it appears in the family history, should be kept under observation before acceptance, if accepted at all. Asthma is frequently associated with pulmonary tuberculosis. Soca found it in 500 out of 700 cases, and Pottenger in 7 out of 75 tuberculous patients in his sanatorium. The author collected 36 cases of asthma in which tubercle bacilli were found in the sputum. Trousseau considers asthma and tuberculosis as an expression of the same diathesis. The combination is not so very rare. Obesity makes the prognosis worse and the lung disease usually runs a rapid course. In one private institution, 79 per cent of the patients were under standard weight for height and age and all the cases had at some time given a positive sputum. In a public institution, 62 per cent of the cases showed positive sputum and 88 per cent were under standard weight for height and age. A recent report from the Trudeau Sanatorium shows the relation existing between age and tuberculous disease in a group of 989 cases and, in addition, the present condition of patients who had passed through the sanatorium. The great campaign carried on in the United States during the past twenty years against tuberculosis has had an appreciable effect upon mortality. The degree of vital resistance of the patient is of great importance in the prognosis. A good family history is not as valuable a factor in selection as a bad family history is hazardous to selection. Partial immunity of six-sevenths of the human family must be largely the result of repeated insignificant infections. As Löwenstein has said, "Only the tuberculous are tuberculosis-immune." Immunity may also be produced by the use of tuberculin over a long period of time.—*Tuberculous Disease in Life Insurance Selection, W. B. Metcalf, Med. Insur. & Health Conserv., April, 1921, xxx, 251.*

Tuberculosis Control.—The Framingham Community Health and Tuberculosis Demonstration has made every effort to find tuberculosis, to treat the disease, to educate against its spread, and to cure known cases. All this work has been carried out with the generous aid of the local Framingham agencies, official and private. During a period of nearly four years the Demonstration has had under observation or treatment a total of 366 cases, including arrested as well as active cases. From a study of these cases the following tentative standards have been set up, any of which further experience may modify: 1. The minimum number of cases in the average community that will probably escape detection in an early stage of the disease, in spite of reasonably adequate machinery. About 50 per cent of advanced cases are undiscovered in most communities at the present time. It would seem that the application of fairly complete disease detecting devices might be expected to reduce this percentage to 4 per cent, if not to a lower figure. 2. The minimum number to die in a representative group of tuberculous individuals. In Framingham 21 per cent have died. A study of these deaths shows that 5 per cent might have been saved if the treatment machinery in the community had at all times during the Demonstration been operating with complete success. 3. The maximum number that may be reported before death. Ninety-three per cent of tuberculosis cases were reported before death, other communities reporting from 60 to 80 per cent. 4. The extent of tuberculosis in the population. A thorough examination of thousands of the population reveals active tuberculosis in about 1 per cent and arrested disease in about another 1 per cent. The average normal American community is at the present time aware of three to five known active cases for each annual death. The Demonstration during its first year, increased this ratio to 9 to 1. 5. The minimum number of cases needing sanatorium treatment. Nearly one third of the active cases in the community require institutional care and can be materially benefited. 6. The minimum number of beds required for tuberculosis treatment. A city of 100,000 people would need at least 100 institutional beds for the treatment of pulmonary and nonpulmonary tuberculosis. 7. Minimum mortality rates. Fewer cases, particularly fewer advanced ones, are found. The rate for the complete Demonstration period, 1917–1920, when compared with the previous decade, 1907–1916, represents a reduction of 31 per cent or about one third. The rate for 1920 represents a reduction of 47 per cent, or about one-half. The Appraisal Committee, which studied the Framingham work about one and a half years ago, stated that for a period of five years a rate which averaged below 90 per 100,000 would be significant, as reflecting directly the special efforts to decrease tuberculosis. If the rate for Framingham for 1921 proves to be as low as that for 1920, the average rate for the five years of the Demonstration will then be approximately 80 per 100,000, which is ten points below the average set by the Appraisal Committee. Such a rate, while gratifying, ought to be further lowered.—*Certain Minimums and Maximums in Tuberculosis Control, D. B. Armstrong, Am. J. Hyg., May, 1921, i, 278.*

Dispensary Control of Tuberculosis.—The total number of patients, tuberculous and nontuberculous, under the care of the Associated Clinics of Greater New York, was 40, 885 in 1920, as against 43,108 in 1919. Of these 40,885, there were 12,218 tuberculous patients, the remainder being either suspects or doubtful cases, and nontuberculous contacts, mostly children, kept under observation because living in homes where there was or had been recently a tuberculous member. In all boroughs, 19,103 new people came for a first examination in 1920 as compared with 20,612 in 1919. The number of readmissions of former patients was 11,150 for 1920 as against 11,096 in 1919. The total attendance during 1920 at the 29 tuberculosis clinics, now comprising the Association and covering the entire city, was 113,874, whereas it was 128,283 in 1919. The number of nurse's visits to the homes of the patients, and elsewhere on their behalf for various social services, was 61,260 in 1920 as compared with 56,853 in 1919. Preventive work for the protection of children exposed to tuberculosis has continued to be emphasized by the clinics. In 1920, 18,135 such children have been kept under observation, as against 17,770 in 1919. The proportion of children under sixteen years of age at the clinics to the total number treated has been an increasing one. The children's visits to the clinics, on the other hand, decreased in 1920, namely 43,305, as against 48,259 in 1919. During 1920, 30,940 cases were discontinued. Of these, 19,054—according to the medical records—were found nontuberculous; 8,581 tuberculous; and in the case of 3,305, no diagnosis was arrived at before the patients left the clinics. Of the 8,581 tuberculous patients, whose cases were terminated in 1920, 8,455 were of the pulmonary type and 127 were suffering from other forms of tuberculosis. The disease, at the time of the first examination of the 8,455 pulmonary cases, was incipient in 3,842, moderately advanced in 3,695, and far advanced in 918. Though many patients remain under the observation of the clinics for only a short time, sputum was reported positive for tubercle bacilli in 14 per cent of the first stage, in 28 per cent of the second stage, and in 51 per cent of the third stage cases. In New York City, on December 31, 1920, 27,919 cases of pulmonary tuberlosis were registered at the Department of Health and classified as follows: Attending tuberculosis clinics, 3,485; under the care of private physicians, 3,193; in hospitals, within the city, 3,394; out of town and in sanatoria, 3,035; remaining at home, 9,449; not found, 5,363. Though registration is acknowledged to be incomplete, these statistics show that on that day 21,490 cases of tuberculosis were a home problem in New York. About 15,000 new cases will be added during the coming year. At the time of the organization of the Association of Tuberculosis Clinics in 1907, the death rate for tuberculosis in New York City was 238 for every 100,000. In 1920, it was reduced to 126. If this first death rate had been prevailing last year, we would have had to register 13,483 instead of the 7,134 deaths which occurred. Improvements in living conditions are responsible for some of this gain; also the coöperation of other agencies. Reports, available only since 1909, show 251,729 new patients, tuberculous and nontuberculous, examined and treated; of these, 80,215 children kept under observation and care of the clinics; 36,118 patients directed to hospitals and sanatoria; and total clinic attendance equalling 1,469,557 visits paid to the doctors, nurses, and social workers. Visiting nurses paid 961,064 calls to the homes of patients and to other social agencies to instruct, comfort and aid their charges. Figures are inadequate even to suggest the services that have been rendered, but give an idea of what has been attempted to alleviate suffering among the victims of tuberculosis and for the protection of the community.—*Dispensary Control of Tuberculosis, 1920 Year Book, Ass. of Tuberculosis Clinics of New York.*

Building Tuberculosis Sanatoria.—In the preparation of standard plans for the several types of tuberculosis institutions, the needs of ex-service men as patients being especially considered, the following general requirements should be borne in mind: 1. location and site; 2. function for which buildings must be provided; 3. general layout; 4. medical administration; 5. general administration; 6. patients' quarters; 7. hospital building; 8. semiambulant patients' quarters in general; 9. semiambulant patients' quarters for cold belt; 10. semiambulant patients' quarters for warm belt; 11. ambulant patients' quarters for cold belt; 12. ambulant patients' quarters for warm belt; 13. dining halls, etc.; 14. other service and working buildings; 15. residences for staff and employees; 16. laboratories; 17 community building; 18 occupational and prevocational therapy. All these items are discussed in detail. In an appendix the requirements for laboratories for tuberculosis sanatoria and hospitals, as laid down by E. R. Baldwin of Saranac Lake, are described.—*Notes on Tuberculosis Sanatorium Planning, Pub. Health Reports, June 17, 1921.*

Standard Tuberculosis Sanatoria.—From data collected from every available source, the U. S. Public Health Service has prepared and published plans and specifications for a model sanatorium for tuberculosis patients, especially those from the World War. Where possible these plans will be followed in future Service hospital construction; and where conditions will not allow exact adherence they will be used so far as possible. The plans group the administration buildings in the centre around three sides of an open court. Facing from the fourth side, from across a roadway, stands the infirmary, its wards radiating away in wheel-spoke fashion. On the opposite side of the administration buildings, close up, is an auditorium and an open air theatre. A short distance beyond this wards for semiambulant patients are disposed along a concave arc; and a little further away are the wards for the ambulant patients. The officers', nurses' and attendants' quarters are severally grouped here and there on the right; and the industrial buildings (power house, etc.) are grouped on the left. Provision is made for occupational therapy and for vocational training for selected patients.—*From Health News, Bull. U. S. P. H. S., July, 1921.*

General Hospitals and Tuberculosis Patients.—The opening of wards in general hospitals for tuberculous patients, as recommended by the American Medical Association at its recent annual meeting in Boston, will, it is believed by the U. S. Public Health Service, be of enormous benefit not only to most of the two million known victims of the disease in the United States but also to thousands of others in whom the disease is incipient and easily suppressible, if promptly treated. Tuberculosis in this stage is difficult and often impossible of positive diagnosis, even by an expert, and many persons, even when told by their family doctor that their case is "suspicious" and that they should take precautionary treatment, fear the stigma of an avowed tuberculosis hospital and put off action until recovery has become long and difficult. In a general hospital the diagnosis will not be made public and the family will not be embarrassed; but at the same time all necessary precautions can be taken to avoid danger of infection to others. The resolution was prepared and recommended by the National Tuberculosis Association in 1916; its approval now by the American Medical Association shows a very marked change in medical sentiment. In support of the new policy it is argued that in many small cities two hospitals, one general and one tuberculous, can be run only at a loss, but if combined would pay operating expenses, especially as the combined hospital would draw many secret tuberculous cases. Many general hospitals could easily enlarge their facilities by fitting up wards, roofs, porches, and unused open air spaces and thus provide greatly needed space for tuberculous patients, both former Army men and civilians. The routine treatment of tuberculous patients in all general hospitals, instead of as at present in only about one-eighth of those in the country, should enable people in moderate circumstances to obtain preliminary treatment in their home towns instead of being forced to go without or to go to resorts. Such preliminary treatment would habituate the patient to the regimen essential to his cure and to the protection of others, and would enable him to go back to his home and get well under home treatment, as he probably would not have done without such training. Visits to the hospital will also familiarize members of the patient's family with sanitary precautions such as the sputum cup, which commonly horrifies them and is soon given up by home patients. Visits by the family physician to his patient in the hospital would familiarize him with the treatment and enable him to diagnose other cases much earlier. It would also enable him to supervise the later home treatment of both this patient and of others. At present, although tuberculosis is the most common of all serious diseases, its treatment is neglected because general practitioners are in the habit of sending their patients away. In short the result of opening the general hospitals to tuberculous patients will, it is believed, be very largely preventive, and will thus be in line with the medical tendency of the day, which is looking more and more to prevention instead of cure.—*From Health News, Bull. U. S. P. H. S., July, 1921.*

Sanatorium Treatment under County Councils.—On May first the duty of providing institutional treatment for persons suffering from tuberculosis falls to the county councils. There are divergent views as to what constitutes sanatorium treatment, both from the point of view of time and method of procedure. A tour of inspection made by experts would ultimately do much to raise the standard of sanatorium treatment. At present there is conflicting eivdence. E. Ward thinks that the calculation that 2 out of 10 early cases are cured or materially relieved by this treatment is too optimistic, while Saugman has shown that complete and permanent recovery can be effected in 8 to 9 out of every 10

early cases.—*Sanatorium Treatment under the County Councils, Editorial, Lancet, April 16, 1921 cc, 813.*

Tuberculosis Recreation Centres.—The majority of tuberculosis cases, discharged from sanatoria, though improved, are liable to a breakdown under ordinary conditions, unless something further is done for them. For this reason Collins, the tuberculosis officer of the County Borough of West Ham, England, suggests that tuberculosis recreation centres be established in populous districts. The site for such centres should be an open space easily accessible from all quarters of the district. The buildings can be of the simplest construction like wooden huts, but should be well heated, ventilated and lighted. The rooms should be comfortably furnished and supplied with periodicals, daily papers and indoor games. The plan should include a dining hut, where meals could be obtained without charge. The centre should be under medical supervision; rest and exercise of the patients suitably regulated; and plans for their daily life roughly mapped out. It might form the nucleus of a much larger scheme which might be called a tuberculosis day colony. The expansion could be accomplished by adding workshops for occupational training and granting allotments for farming produce, raising chickens, etc. The recreation centre should not in any way supplant the sanatorium for early cases nor the hospital for advanced cases. For patients whose home environment is especially bad, sleeping quarters might be provided, but the majority could sleep at home and would be better contented by such an arrangement. The centre would be used chiefly by men of the industrial class, but could also accommodate women. For married women with children some other plan must be devised that does not involve long absence from home. All children suffering from tuberculosis should be treated in an open air school or some other desirable institution. Such a plan would relieve the distress of many tuberculous people and provide, at a comparatively moderate expense, rest and recreation, food, fresh air, medical supervision, and limited segregation.—*A Scheme for Dealing with Ambulant Cases of Pulmonary Tuberculosis, F. G. Collins, Tubercle, April, 1921, ii, 306.*

The Public Health Nurse in the Campaign.—It is estimated that there are 20,000 consumptives in Massachusetts at the present time. J. S. Hitchcock has said that 80 per cent of the tuberculosis work properly belongs to the nurse, and this estimate is probably not too high. Every public health nurse should understand the essentials of successful treatment. The rest method is easy to learn and easy to teach and can be carried out satisfactorily in the home. It is not sufficiently appreciated what can be accomplished by prolonged bed rest in the open air. Correspondence classes should be formed by the State Department of Health. The patient should agree to follow strictly the detailed instructions given by the nurse and by correspondence. Reports should be made in writing to the doctor of the class at stated intervals. This plan would permit of the instruction of a large number of patients at a minimum of expense. It would lighten the work of the nurse.—*The Importance of the Public Health Nurse in the Tuberculosis Campaign, J. H. Pratt, Boston M. & S. J., May 26, 1921, clxxxiv, 537.*

Haverhill Tuberculosis Association.—Communities which are showing interest in health problems are urged to observe the work done by the Haverhill Tuberculosis Association, for this organization is one of the most progressive in the state. The results obtained in that city are due in a great degree to medical direction and oversight, acting in close coöperation with the city board of health. The people of Haverhill have endorsed the work in a liberal way. The hospital for tuberculosis patients is a model of its kind and the situation is ideal. The Association has felt that one great difficulty in the early recognition of tuberculosis has been lack of painstaking care in the early study of doubtful cases, and in order to assist physicians has prepared a simple history card for the physician's use on which may be recorded all essential facts relating to a suspected or recognized case. The value of such a card lies in keeping before the doctor suggestions of the details of the essential investigation and a record of conditions found. These cards may be obtained at the *Journal* office and at the medical supply stores at a cost of five cents each. All profits from the sale will be used to continue and extend the work in Haverhill.—*Editorial, Boston M. & S. J., June 30, 1921, clxxxiv, 711.*

Lower Lobe Tuberculosis.—Among 1000 consecutive admissions to the sanatorium at Bedford Hills, N. Y., only 3 cases of definite lower lobe tuberculosis were found. Lower lobe lesions occurred in 18 other cases; but after careful study, 17 proved to be nontuberculous, and in 2 patients old tuberculous lesions were found at both apices, in spite of the fact that extensive physical

signs existed at one base and that the upper lobes appeared to be normal. Of the 17 nontuberculous patients, 11 suffered from chronic nonspecific inflammatory conditions, and 5 from bronchiectasis.—*Chronic Pulmonary Tuberculosis Primarily in the Lower Lobe, J. Rosenblatt, J. Am. M. Ass., June 11, 1921, lxxvi, 1647.*

Pathology of the Mediastinal Lymph Nodes in Tuberculosis.—Gloyne examined in detail the mediastinal nodes in 5 tuberculous and 3 nontuberculous cases by dissecting away every bit of lung tissue, slicing through each node, and counting the total number of nodes in each group. The total number of nodes draining the lung, that is, superior and middle mediastinal, varied from 36 to 79 in the tuberculous and from 40 to 65 in the nontuberculous cases. On the average there were 9 tracheal, 35 interbronchial, 5 bifurcation, and 10 superior mediastinal nodes (right and left sides added together). Only 4 calcareous nodes were found in the tuberculous cases: 2 in the bifurcation, 1 in the right tracheal, and 1 in the left interbronchial group. Two of these had been noted in radiograms during life. No calcareous nodes were found in the nontuberculous cases. Apart from calcification, naked eye evidence of disease was not marked in the nodes from tuberculous cases, except in one case where every node showed small caseating tubercles. A fresh series examined microscopically, however, showed typical tubercles with giant cells in 12 out of 18 nodes, and tubercle bacilli in all. There was not sufficient variation in the microscopic lesions in the different groups of nodes to demonstrate the line of march of the tuberculous infection along the mediastinal chain. Anthracosis was noted in the nodes of all the cases examined, except in that of a child of four. The interbronchial group was most densely pigmented, showing signs of anthracosis even in the four year old child. Theoretically, soot should produce no shadow in a radiogram. In experiments on rabbits inoculated with suspensions of coal dust, no shadow was produced, except if placed in a sufficiently thick layer. It seems possible, therefore, that carbonaceous particles, such as soot, coal dust, etc., may cause an increase in the thickness of the gland which would give a sufficiently dense shadow to cause confusion with lymph node enlargement due to microscopic tubercles. Calcareous nodes are readily distinguishable in the radiogram because of the extreme density and sharp outline of their shadows. The shadows produced by anthracosis, caseation, microscopic tubercles and malignant disease did not afford sufficient differentiation to warrant definite conclusions.—*A Note on the Pathology of the Mediastinal Glands in Tuberculosis, S. R. Gloyne, Tubercle, April, 1921, ii, 300.*

The Diagnosis of Tuberculosis.—Academically it is possible that 50 per cent of the world's population is suffering from tuberculosis. The practical test is the finding of the bacillus in the sputum or lesion. This test is positive in 70 per cent of severe cases, but only in 30 per cent of all cases. Samuel Gee taught that a pulmonary lesion which does not clear up in six weeks is either tuberculosis or empyema. Two exceptions to this would be pneumokoniosis or the dust phthisis of miners and stone cutters, and chronic bronchial catarrh, as it occurs in the poorer districts of big cities like London and Manchester. The author disagrees with the general opinion as expressed by Gee, in that he believes miners' phthisis is always tuberculosis engrafted on an irritated lung and that chronic bronchitis is also tuberculosis and will respond satisfactorily to treatment by insufflation in from two to three weeks.—*Diagnosis in Tuberculosis, O. Paget, Med. Rec., June, 11 1921, xcix, 1005.*

Gassing vs. Tuberculosis.—Our public health hospitals, sanatoria, and convalescent homes are filled with men suffering, as they believe, from tuberculosis, but in reality from the late effects of gas poisoning. Many of these patients have been diagnosed as tuberculous because of certain symptoms common in tuberculosis, and because many physicians have not learned to make a differential diagnosis between tuberculosis, gas poisoning, influenza, trench or barrack-room bronchitis, and nervous exhaustion. Of the immediate effects of gas much is known; of the late effects, very little. Gases owe their efficiency to their irritative and escharotic effects on the respiratory tract, and the contraction of the scars thus produced may, and often does, lead to serious and progressive mechanical difficulties, not only to the ingress and egress of air into the bronchi, bronchioli and alveoli, but to the pulmonary circulation as well. It is also known that these gases have a certain selective action. Mustard gas affects chiefly the upper air passages; chlorine gas injures the lining of the entire respiratory tract, resulting, frequently, in chronic lung lesions; phosgene, least severe in its immediate effects, often leads later on to serious injury of the lung tissue. The basis of these changes caused by gas is a proliferative fibrosis which destroys, to a greater or less extent, the natural

protective properties of the bronchi and leads to their invasion by secondary organisms. If tuberculosis plays a part in this secondary invasion, it is a minor one. X-ray examination of the lungs in these gas cases shows a very definite picture. There is usually considerable increase in the tissues around the hilum of the lung, marked increase of peribronchial tissues extending toward, but rarely into, the parenchyma, and more toward the bases than upward. The apices themselves are usually clear. In addition to this, there are often localized areas of dense fibrosis. There are two groups of symptoms presented by these gas cases; pulmonary and the constitutional. Prominent among the first are cough, expectoration, hemorrhage, pain, or a sense of constriction in the chest, dulness, usually at the bases and due to a thickened pleura, diminished voice and breath sounds due to the same cause and râles of every variety and description. Among the constitutional symptoms are loss of strength, fatigue, shortness of breath, signs and symptoms of a marked psychoneurosis and increased reflexes. Fever, rapid pulse, loss of weight, anemia and other symptoms characteristic of tuberculosis, are conspicuous by their absence. The majority of these men go under the diagnosis of pulmonary tuberculosis. They often give a history of sudden, acute febrile attacks with or without cough and sputum. These attacks disappear as suddenly as they come, leaving a feeling of intense lassitude, which lasts for a considerable time. Such sudden attacks are characteristic of these late gas cases. These men require rest away from a medical atmosphere, and particularly, sympathy and encouragement. An outdoor life should be prescribed. The man who has been gassed should be treated; not his lungs.—*Diagnostic Pitfalls. The Late Effects of Gassing vs. Tuberculosis, John B. Hawes, 2nd, Boston M. & S. J., July 7, 1921, clxxxv, 1.*

Fatigue as a Test of the Tuberculous.—When the resisting powers are low, under the influence of fatigue the organism uses up its nitrogenous reserves and finally the albumin of its own tissues. It is possible to determine the lowering of the nitrogenous reserves by investigating the intermediate nitrogen metabolism in the blood and the changes in weight of the body. This has been worked out at Maragliano's clinic by Sivori, and has formed a reliable means of ascertaining the resisting powers in the tuberculous to aid in allowing exercise or self-support and in estimating the effect of treatment. For practical purposes it is sufficient to record the changes in weight. For this the patient is kept in bed in absolute repose for ten days, with a diet of from 2,200 to 2,300 calories, including from 90 to 100 gm. of protein. The diet is kept at a constant figure, and every day at the same hour the weight is recorded. By the sixth day if the weight remains stationary or has increased, the patient can get up and take a daily walk of 2 km., for a ten day period. If the weight diminishes, there is little hope of organic resistance. If it remains stationary or increases, the walk is increased to 4 km. for another five days. If the weight diminishes then, we can assume a slight margin of resistance. If it does not diminish during this time nor in another five day period, other conditions equal, we can say that the individual has a good margin of organic resistance, and is capable of responding to specific treatment which requires the active participation of the organism.—*La fatica come elemento di studio del margine di resistenza organica nei tubercolosi, V. Pietroforte, Rif. Med., December 18, 1920, xxxvi, 1169.*

Weight Prediction.—In a previous paper the authors traced the development of the various measurements of the length of the body, not including the legs. They reported the results of their experiments with Bornhardt's method of estimating body weight, and discussed the sitting height recently urged by Pirquet, and the stem-length formula proposed by Dreyer. Dreyer realized, as had Bornhardt but practically no one else before him, that in predicting weight in adults, age was of small use, and that even body length alone was inadequate. Like Bornhardt, he made simultaneous use of the chest measurement, but substituted stem-length for stature, and constructed his formula in an entirely different fashion. To do Dreyer justice, it is important to test his combined formula, using not only chest girth, but also stem-length. Pirquet, in connection with a new and elaborate system of feeding, based on milk values instead of on calories, proposed a new formula for determining the state of nutrition. He had observed that a measurement little noticed hitherto, the sitting height, stands in close relation to the cube root of the body weight. Trial of these new methods appeared important. Pirquet had given no original observations sufficiently complete to serve as a basis of comparison of the three methods, and Dreyer had published observations on only 16 subjects. In this paper, the authors report their observations on 16 healthy males in addition to the 16 reported by Dreyer. The ages ranged from thirteen to fifty-two years. The weights of

these thirty-two healthy males were predicted by Pirquet's formula with an average error of 17 per cent, by Bornhardt's with an error of 8 per cent, and by Dreyer and Hanson's method with the low error of 4.47 per cent.—*Weight Prediction by the Formulae of Bornhardt, of Von Pirquet, and of Dreyer, H. Gray and H. F. Root, Boston M. & S. J., July 7, 1921, clxxxv, 28.*

Intrathoracic Movements.—Just as in ordinary photography, so for a good X-ray plate two requisites are essential. The object must be at rest and there must be differences in density of the various parts to be rayed. The latter condition is ideal in the chest, but there is no voluntary control over the motion of some of the organs involved. The act of inspiration raises the chest walls, causes the diaphragm to descend, and allows the inrush of air into the area of negative pressure. If inspiration is not complete, the proper density contrasts are not produced and an X-ray picture results similar to that characteristic of tuberculosis. The action of the chest wall in respiration is voluntary and usually easily controlled, as in the diaphragm, but many individuals, especially children, cannot control it. Abdominal lesions restrict its action and true adhesions, as well as nerve lesions, alter its movements. With a lung stiffened with congestion, the diaphragm may lag in its descent owing to a high negative pressure, the air not rushing into the lung to aid its movements. This may simulate adhesions and be confusing. The action of the heart is involuntary and because of its close proximity to the lung its motion may be transmitted to the lung. The great vessels, especially the aorta, have considerable movement due to pulsation which is opposite in time to the heart. The esophagus has definite movements which are revealed by an opaque meal. The lung itself moves in respiration; the fluoroscope shows that on inspiration with the general expansion of the lung the lower bronchi move downward while the upper ones move upward. The author has found that this bronchial motion may be as much as twice the width of the bronchus, but varies in different individuals and according to the violence of the heart action. In order to take correct X-ray pictures of the thoracic viscera, it must be done practically instantaneously. It is now possible to take chest pictures in less than one-tenth of a second. With this method the heart and diaphragm are sharply outlined, the individual components of the hilum differentiated, and the walls of the bronchi plainly shown. The beading of early tuberculosis, the pocketing of bronchiectasis, and early septal changes or beginning alveolar congestion can be visualized and studied. One illustration shows a radiograph made by studying the heart cycle and getting the exact interval between complete systole and diastole. The exposure was made during systole and diastole on the same film, each exposure being less than one-tenth of a second.—*A Study of Introthoracic Movements, W. W. Wasson, Colorado Med., April, 1921, xviii, 76.*

Lung Mapping with Bismuth Mixtures.—*Summary:* Bismuth mixtures can be injected into the bronchi and lung of living patients without doing harm. The injection of opaque substances into their lungs will open up an enormous field of usefulness in the study of cough, the expulsion of secretions from the lung and lung drainage. It will also localize bronchial strictures in the same manner as occurs in the esophagus. Furthermore, it will be of the greatest aid to the thoracic surgeon by mapping out the abscess cavity in that lobe of the lung on which he is to operate. A definite lung abscess cavity is seldom seen bronchoscopically. Pus is usually seen coming from a small branch bronchus, and the abscess cavity may be well around a corner and not in a direct line with the bronchus from which the pus is oozing. An injection of a bismuth mixture or some other opaque substance will clear up this error. Bismuth when it enters the abscess cavity is interpreted in the radiographic plate by its metallic lustre, and when it is in the lobular lung structure it is interpreted by its dull opacity. Pus diffuses and soaks the lung structure, and this often makes the involved area appear many times larger than it really is. The amount of bismuth injected in these patients was an 8 cc. mixture of bismuth subcarbonate in pure olive oil, 1 in 2 and 1 in 3. The mixture is sterilized by boiling. The injection should be made slowly and not with a squirt, for the picture may be spoiled by bismuth soaking the lung. From these preliminary studies it seems that cough and the action of cilia may not be the only means of expelling secretion from the lung. While bismuth mixtures were originally injected by the author for purposes of lung mapping of abscess cavities in their proper lobes, it seems to have been of apparent benefit to the two patients in whom it was tried. So far it has done no harm.—*Lung Mapping by the Injection of Bismuth Mixtures in the Living, H. L. Lynah, N. York M. J., July 20, 1921, cxiv, 82.*

Striae Distensae in Consumptives.—The occurrence of striae in pulmonary tuberculosis seems to be very rare, or, at least, little observed; at any rate, little has been published. Among 5,800 patients treated at Boserup sanatorium (Denmark) the author found 12 who according to the records exhibited striae. Four of these he observed himself. Three salient features emerge from the study of the records of the above 12 cases: (1) the great gain of weight in a short period; (2) the youth of the patients whose ages were within the narrow limits of fourteen and twenty-two years; and (3) the preponderance of males over females (10 to 2). The gain of weight was so great (from 7 to 24.7 kilos) and so constant, that it may be surely regarded as an essential factor in the causation of the striae. Their appearance in places where accumulations of fat are most prominent, that is, the hips, loins, and shoulders, further supports this view. There was nothing to suggest that they could be associated with any compensatory dilation of the healthier side of the chest, for they never occurred on the thorax itself, and their distribution could not in any way be correlated with the site of the disease. In most cases the disease had lasted only a short time, and there had been little or no fever to indicate marked toxemia. Any appreciable reduction of the vitality and nutrition of the skin by toxic influences can, therefore, be excluded. The marked gain of weight in itself suggests that the toxins of the disease cannot have affected these patients greatly.—*Striae Distensae in the Skin of Consumptives, K. Hammer, Tubercle, May, 1921, ii, 349.*

The Blood Pressure in Pulmonary Tuberculosis.—The auscultatory method has been used as the most accurate. When numerous observations are made at frequent intervals in cases of pulmonary tuberculosis, fluctuations in the blood pressure are noticed from time to time, but the general trend in advancing disease is downwards. The diastolic pressure is less affected than the systolic and its variations less reliable. When the minimum pressure reaches below 60 mm. Hg, the general tone of the patient is poor and progress towards recovery is, in consequence, retarded. An instance is given of a patient whose diastolic index ranged between 50 and 36 mm. Hg., with a systolic of 120. He suffered from a general feeling of lassitude with morning headache and muscular pains. With eleven months residence in the sanatorium his condition improved only slightly, although clinical examination revealed no extensive lesion in the lungs. However, if the systolic pressure is low, namely, 90 to 100 mm. Hg., the outlook seems to be better when the diastolic pressure shows a corresponding decline. But if it registers in such cases between 70 and 80 mm., making a pulse pressure of about 20 mm., the chances of improvement are not so promising. These patients have weak hearts. They are fragile, lack vitality and do not respond well to treatment. All these observations were made on male ambulatory patients in whom the temperature chart failed to show any unfavorable signs.—*Blood Pressure in Pulmonary Tuberculosis, A. G. M. Grant, Tubercle, May, 1921, ii, 337.*

The Intracutaneous Tuberculin Injection as Revealed by the Capillary Microscope.—A study was made in the living subject of the capillary vessels and superficial tissue at the site of an intracutaneous tuberculin test. The method followed was that proposed by Weiss, consisting of transillumination of the skin through paraffin oil or old oil of turpentine. by means of direct sunlight or strong artificial light (Leitz microscope lamp). Observations were made with the Zeiss binocular microscope, permitting a magnification of 35 diameters. During the first 6 hours after injections, alterations in the skin structure were of a mechanical nature, in no way characteristic of a tuberculin reaction. Thereafter, any reaction occurring was of a specific nature, and consisted of inflammatory changes involving the vessels, papillae and horny layer. By means of this technique, with a little experience and a control injection of physiological saline solution, the result of an intracutaneous tuberculin test may be foretold many hours before the macroscopic picture can be differentiated.—*Das kapillärmikroskopische Bild der intrakutanen Tuberkulininjektion, O. Lade, Arch. f. Kinderh., August 31, 1920, lxviii, 58.*

Chondroturia in Pulmonary Tuberculosis.—At necropsy of severe phthisis, marked fatty degeneration of the renal parenchyma is usually found. This is apt to give during life the reaction for chondrotin-sulphuric acid. This reaction is positive if marked cloudiness occurs in 5 cc. of urine, after adding a few drops of dilute acetic acid and 1 per cent horse serum. Among 175 severe cases albumen was found in 20, or 11.4 per cent, and chondrotinic acid in 85 or 42.8 per cent. Of the latter class 61 were tested 10 or more times. Twenty-four of these 61 retrogressed. In the others the general condition and the state of the reaction showed little harmony. The prognostic value is limited.

The constant presence of the reaction makes prognosis doubtful. Just as urobilinuria denotes liver damage, so does chondroturia indicate kidney damage.—*Über Chondroturie bei Lungentuberkulose, K. Dietl, Wien. klin. Wchnschr., March 24, 1921, xxxiv, 133.*

Alcohol Extracts of the Tubercle Bacillus as Antigens.—The authors consider the peptone B_2 antigen of Calmette and Massol and the egg antigen of Besredka the most active tubercle bacillus antigens, but point out that the former is obtained only by the use of a peptone rich in albumose, not always available, while the Besredka antigen keeps but a short time. Alcoholic antigens, such as that described by Petroff, have been too little sensitive in the case of ethyl alcohol, or excessively so in the case of methyl alcohol. The authors have modified the alcohol extraction method of preparation by preliminary treatment with acetone, previous investigations having apparently shown that the acetone removes a great number of lipoids inessential to the reaction, leaving the essential phosphatids. Their method is as follows: Tubercle bacilli grown six weeks on glycerol broth are sterilized at 120°C. for one-half hour, washed with water, dried in the oven, and left in contact with 100 volumes of acetone for twenty-four hours. The mass is then filtered off and treated with alcohol in the same proportion for ten to twelve days at 38°C. The mixture is filtered and the clear extract diluted 1:10 for use. Such an extract deposits a light precipitate on cooling and gives an opalescence comparable to a 1:10,000 lecithin emulsion in water. Titration of antigens prepared by this method showed that human and bovine tube cle bacilli and diphtheria bacilli were rich in antigen reacting with antituberculous serum, while avian and piscine tubercle bacilli and paratubercle bacilli had a moderate concentration, and streptococci and pneumococci were lacking in such antigen. The methyl alcohol extract equalled the antigen of Besredka in activity. It proved to be rigorously specific; exceptionally, it reacted with syphilitic sera, but in these cases tuberculosis could not be ruled out. The methyl alcohol extract is more active than the ethyl alcohol product and may be kept indefinitely in the absence of air, light and moisture.—*Recherches sur la valeur antigène des émulsions bacillaires et des extraits éthyliques et methyliques de bacilles tuberculeux, S. Nègre and A. Boquet, Ann. de l'Inst. Pasteur, May, 1921, xxxv, 300.*

Specificity of the Besredka Antigen.—The complement fixing power of Besredka's antigen was tried in the presence of 1:20 emulsions of the bacterial bodies of a variety of organisms. Antituberculous horse serum, prepared by repeated inoculation with tubercle bacilli, and serum from human tuberculous subjects, in contact with the antigen of Besredka, fixed alexin in high amount. The same sera behaved like normal sera in the presence of other antigens, including streptococcus, pneumococcus, B. coli, B. typhosus, B. paratyphosus, B. mallei, B. anthracis and B. subtilis. In 3 cases out of 20 a positive reaction was noted with the serum of tuberculous patients and a diphtheria antigen. The sera of horses immunized against various bacteria did not give positive reactions when used with the tubercle bacillus antigen, except in the case of the antiserum to B. diphtheriae, when a weak fixation occurred. The serum of typhoid fever, erysipelas and nephritis patients did not give positive complement fixation with the Besredka antigen.—*De la spécificité de l'antigène tuberculeux de Besredka, A. Urbain and B. Fried, Ann. de l'inst. Pasteur, May, 1921, xxxv, 294.*

Significance of Types of Tubercle Bacillus.—Notwithstanding the vast epidemic importance of human tuberculosis, it has no significance as a cause from which its epizoötic prevalence may arise. The occurrence of bovine tuberculosis among human beings, especially children, is wholly chargeable to the epizoötic prevalence of tuberculosis among cattle. While it is a serious evil which should be fought with unremitting energy, it does not lead to the dissemination of tubercle bacilli, and therefore has no significance as a cause which contributes to the perpetuation of tuberculous disease. The widespread, practically epizoötic prevalence of tuberculosis among hogs is chargeable to the epizoötic prevalence among cattle, but is in itself insignificant as a cause which contributes to the perpetuation of tuberculosis. The epizoötic, really panzoötic, prevalence of tuberculosis among cattle is entirely due to the bovine type of the tubercule bacillus, and tuberculosis among cattle is a great self-perpetuating plague. The bovine type of the tubercle bacillus is a pathogenic parasite which is not only seriously destructive to its specifically true host, but a parasite which, making its attack through its true host, also causes tuberculous disease, epidemic and epizoötic in character, in foreign hosts, through which it does not perpetuate itself. The epizoötic prevalence of tuberculosis among fowls is dependent upon the avian type of the tubercle bacillus, which lacks the power to serve as the cause of an epidemic or an epizoötic

occurrence of tuberculosis among mammalia. The human and the bovine types of the tubercle bacillus have no significance as a cause for the epizoötic development of tuberculosis among fowls. The difference in the pathogenic ranges of the several types of the tubercle bacillus is very impressive. It seems clear in the light of our present knowledge that the human and the avian types, though they occasionally are found in other than their specifically true subjects or hosts, are each responsible for only one plague-like manifestation of tuberculous disease. But the bovine type, though its perpetuation depends almost entirely on its growth and multiplication in its specifically true host, the bovine species of animals, is the true cause of three important plagues, a human, a bovine and a porcine, and, in addition, is responsible in most instances for the less common occurrence of tuberculosis among other domestic mammals than cattle and hogs. It is the supremely pathogenic type of the tubercle bacillus.—*The Epidemic and Epizootic Significance of the Different Types of the Tubercle Bacillus, E. C. Schroeder, J. Am. Vet. M. Ass., July 1921, lix, 434.*

Culture of Tubercle Bacilli on Egg Yolk.—The medium contains nothing but egg yolk, soda and water. Three hundred and fifty cc. of egg yellow are stirred in distilled water and treated with 1 per cent soda solution until a thin bulk of it taken for test is transparent. About half the volume of the egg yolk is required usually. The mixture is then diluted to 7000 cc., or twenty times the volume of the egg yolk, placed in flasks and autoclaved at 110° C for twenty minutes. No meat extract, peptone, salt or glycerol is added. Following large inoculations of tubercle bacilli, growth is noted on the following day and proceeds rapidly. On the fourteenth day the medium is suitable for the preparation of antigen for complement fixation. The antigen consists simply of such a culture sterilized and rendered homogeneous by agitation. No matter how old, such cultures do not give the characteristic odor of tuberculin; yet they are quite rich in the latter, as can be shown by appropriate tests on tuberculous animals.—*Culture des bacilles tuberculeux dans du jaune d'oeuf, A. Besredka, Ann. de l'inst. Pasteur, May, 1921, xxxv, 291.*

Pulmonary Tuberculosis in the Aged.—Tuberculosis is not uncommon in the old, although the symptoms are very mild and inconspicuous, thus rendering the diagnosis difficult. Among 20 such patients, ranging in age from sixty-four to eighty-two years, the history disclosed little in the way of former hemoptysis or febrile attacks. At most these persons complained of weakness recurring occasionally after exposure to cold. Their general condition was relatively good. Dyspnea was frequently present, especially on exertion. Cough was almost constant and of long standing, but expectoration was often lacking, the sputum being swallowed, as in children. Bacilli were found in 8 out of 12 cases. Auscultation was sometimes attended with difficulty, because signs of emphysema almost completely masked those of tuberculous disease. Under these circumstances the complement fixation reaction for tuberculosis was used for diagnostic purposes, with marked success. Besredka's antigen was always used, and the technique was that of Bass and of Goldenberg-Fried. Seventeen of the 20 patients yielded a positive reaction; one of the negative cases had very advanced tuberculosis, with prospects of early fatal ending. The results lead the author to subscribe to Calmette's statement that a considerable proportion of the deaths ascribed to chronic bronchitis should actually be considered due to tuberculosis. Attention is called to the danger of undetected cases of tuberculosis in old persons among their family associates. Calmette has related an instance of three successive deaths from tuberculous meningitis in children cared for by an old governess with chronic bronchitis.—*La valeur de la reaction de fixation dans le diagnostic de la tuberculose pulmonaire du vieillard, G. Ichok, Paris Méd., January 15, 1921, xi, 58.*

Tuberculosis in Nurslings.—Tuberculosis is frequent in nurslings, its frequency increasing with the age of the infant. Both sexes are equally attacked during the first year of life but, during the second, males suffer much more than females, the ratio being 5 to 2. In nearly 50 per cent of the cases there is a history of tuberculosis in the parents.

Familial contagion is of the highest importance, hence illegitimate babies are less often afflicted. When a nursing mother presents open tuberculous lesions the baby runs great risk of being contaminated. Two facts dominate the history of tuberculosis in nurslings. The first is that tuberculosis of the bronchial lymph nodes is almost invariably the first important focus of bacillary infection; it is the most constant localization and is found in most cases. This leads one to suppose that the usual entrance of the bacillus in nurslings is the respiratory tract, and it is exceptional to discover lesions which would indicate an intestinal origin of the

infection. The second fact is that tuberculosis in early life tends to diffusion and this tendency is all the more marked the younger the child.

The respiratory forms vary. The tracheobronchial adenopathy, which is nearly always present, may be latent and merely cause pyrexia. Or it may give rise to physical signs or compression symptoms and occasionally to laryngeal phenomena. Bronchitis with a subfebrile state is frequent during the first year of life, offering a very commonplace aspect, but the general health of the baby and tuberculosis reactions will indicate its true nature. The infant may recover, but if he dies autopsy will reveal an ordinary bronchitis kept up by adenopathy; or an ulcerating pulmonary tuberculosis, unsuspected during life, may be found. Bronchopneumonia, frequent during the second year of life, has a bad prognosis. Sometimes localized in foci, at other times diffuse, it is usually characterized by the persistence of its symptoms and the profound changes in the general health. At autopsy, the usual lesions of bronchopneumonia, with or without distinct lesions of tuberculosis, will be found. Ulcerating pulmonary tuberculosis is difficult to diagnose in nurslings; even cavities often remain latent; but when hemoptysis occurs, which is very uncommon, it is a sure symptom of this process. Pleural manifestations are rare and consist of a purulent collection due to the ordinary forms of infection. The dry forms are found only at necropsy.

The digestive manifestations may be divided into simple dyspepsia and gastroenteritis. The former is observed especially during the first year of life and is characterized by emaciation and hyperthermia which are disproportionate to the intensity of the digestive symptoms, the latter being in reality mild. Death often occurs in one to three months. Gastroenteritis, which is quite as frequent during the second as during the first year of life, offers the ordinary clinical aspect of this affection, but its characteristic is that no improvement occurs in spite of a perfectly regulated diet. The nature of these processes is often obscure, and as they cannot be attributed to tuberculous changes in the digestive tract, it is probable that their causal factor resides in tuberculous intoxication.

External tuberculous manifestations are not very uncommon in nurslings, particularly osteitis, Pott's disease, spina ventosa, orchitis, subcutaneous gummata and, more rarely, tuberculides.

The most frequent nervous manifestation of tuberculosis in nurslings is meningitis, while its forms are rather remote from the classified type met with in older children. The eclamptic and somnolent forms are common, likewise the form with paralytic localizations.

Generalized tuberculosis in nurslings often assumes the form of chronic miliary tuberculosis with tubercles scattered throughout the thoracic and abdominal viscera. Clinically, it is made evident by atrophic cachexia with apyrexia, polyadenopathy, and enlarged spleen and liver. Generalized tuberculosis may assume an acute course, either the asphyxiating or the typhoid forms.

In all these various tuberculous processes in nurslings, autopsy usually reveals far more extensive and advanced lesions than were suspected during life, and reactions toward healing are rarely found. Like all chronic infectious processes tuberculosis may act on the bone marrow and cartilages of ossification, thus producing rickets, and the latter condition during the second year of life has been shown by Marfan and Mantoux to depend frequently upon tuberculosis. The diagnosis of tuberculosis in nurslings depends essentially upon tuberculin reaction, and the cutireaction should be the clinician's guide. A positive result will often clear up the nature of symptoms of what was thought to be an ordinary affection, of the first two years of life.—*Editorial, Med. Rec. July 9, 1921, c, 69.*

Study and Treatment of the Pretuberculous State in Infancy.—In order to recognize the signs suggestive of predisposition to tuberculosis, the ensemble of physical attributes of the pretuberculous must be studied. Though infantile tuberculosis is almost always acquired rather than inherited, the physical condition of children of tuberculous parents is such that they are exceedingly susceptible to the disease. Proper and persistent therapy is always effective, even if an infant is already harboring bacilli in a latent focus which needs only some intercurrent infection to start their multiplication. The history may show impaired development, or unusual susceptibility to gastrointestinal or respiratory disturbances. Important signs to be noted on inspection are pallor, transparent skin, long, slender neck, narrow chest, prominent scapulae, blue network of superficial veins, child undersized for its age with long legs and large knees, slow movements, fatigue of obscure origin and susceptibility to chilling. The skin is often the site of chronic or recurrent lesions, ichthyosis being among the most important. The following signs are of diagnostic value, especially if some of them are combined: dolichocephaly, blepharitis, discharging ears, hypertrophy of the

tonsils, lymphadenitis, scoliosis, any or all forms of digestive disturbance and any degree of malnutrition. Parents must be warned that the possibility of a cure depends entirely upon the care with which they will follow instructions. Spoiled children are more likely than others to be sick; they are less likely to be cured. Exercise, work, play, study, sleep and bathing should all be given in dosage proper for the individual case. The value of medicated baths and of massage is insisted upon. Clothing should be light, and should on no account interfere with the movements of the child. Overfeeding is one of the greatest errors that can be made. A regular sensible feeding of wholesome food must be carried out. Concerning the best climate for predisposed children, high altitudes, with dry air in winter, mean less coryza and tracheobronchitis. Nervous cases, however, and cases with arthritis, react badly to such altitudes, because of the extreme cold of the winter months. They should not be sent to resorts frequented by patients with manifest tuberculosis. The country is far preferable to the city. Few drugs should be given, and these with great discretion,—codliver oil to those who take it without a struggle and with whom it agrees. The endocrine secretions are often deficient in pretuberculous cases, and as far as possible such deficiencies should be made up. Combined pituitary and adrenal therapy was found to give good results in selected cases.—*Recherche et traitement de l'état prétuberculeux chez l'enfant (étude clinique), P. Richard, Arch. de Méd. d'Enf., April, 1921, xxiv, 215.*

Complete Pneumothorax in an Infant.—This conditions is extremely uncommon. The patient, a boy of eighteen months, was admitted with cyanosis, cough and dyspnea. He had measles three months before entrance and since then lack of appetite, constipation, wasting and slight cough. On examination the child appeared extremely ill. There was diminished respiratory movement over the left side of the chest with hyperresonance and diminished breath sounds. Over the right chest there were prolonged expiration, bronchovesicular breathing and fine râles. The heart was displaced to the right. The liver and spleen were palpable. Complete left pneumothorax was diagnosed. The child died within twelve hours. Postmortem examination revealed the left lung to be collapsed upon its root, a solid mass of tubercles, with a cavity in the apex, the left pleura studded with tubercles. The right lung contained many miliary tubercles. The hilum nodes were slightly enlarged and hyperemic, but not caseous; the liver and spleen were studded with tubercles. The mesenteric lymph nodes were much enlarged. The infection probably travelled from the mesenteric to the mediastinal lymph nodes and, all along the route, set up areas of caseation up to the left pleural surface which later became adherent to the surrounding parts. During some violent fit of coughing the portion of diseased tissue between a bronchus and the left pleural cavity gave way, probably three weeks before death, judging from the history. From the sudden massive infection of the pleura, general miliary tuberculosis resulted.—*A Case of Complete Pneumothorax in an Infant, Due to Pulmonary Tuberculosis, G. Bourne, Brit. M. J., April 9, 1921, no. 3145, 526.*

Epituberculous Infiltration of the Lungs in Tuberculous Infants and Children.—The authors describe a form of pulmonary infiltration (to which they have given the name epituberculous), occurring only in tuberculous children, but possessing characteristics which entitle it to special consideration and classification. It was seen only in children during the first three years of life, the youngest being seven months. Briefly, the picture was as follows: a history of severe chronic cough with anorexia, pallor, loss of weight and occasional slight fever. Examination of the lungs revealed, usually over the upper lobe, a large area of dulness and bronchial breathing, with comparatively few râles and no signs of cavity or pleuritic exudate. The spleen was often enlarged, but heart and vessels were normal. The leucocyte count was normal, the Pirquet reaction was strongly positive, and many children had other evidences of tuberculosis, such as bone lesions, cervical adenitis and lichen scrofulosorum. The roentgenogram showed a dense, rather homogeneous shadow extending from hilum to periphery. Is this pulmonary infiltration due to specific tuberculous lung changes, or to a chronic unspecific infiltration in the presence of a concomitant tuberculous infection? The latter view seems to be the correct one. Children with such lesions usually recover after a long siege, and the roentgenogram shows a gradually clearing shadow, from periphery to hilum. The ultimate picture shows a clear lung, with no evidences of old tuberculous changes.—*Die epituberkulöse Infiltration der Lungen bei tuberkulösen Säuglingen und Kindern, Helene Eliasberg and W. Neuland, Jahrb. f. Kinderh., 1920, xciii, 3rd series, no. 43, 88.*

The Physical Development of Tuberculous Children.—Two groups of children form the basis of this study. The first (control) group of 614 children, of nontuberculous parentage, either had no symptoms, or, if they had, were negative to tuberculin tests. The second group of 508 patients were children of tuberculous parentage, or were suspected of tuberculosis because of poor physical condition, or were referred to the tuberculosis department from the pediatrics dispensary after a positive diagnosis had been made. No case was regarded as positive unless it gave the characteristic reaction to tuberculin. Tuberculosis in early childhood remains an acute disease over an undetermined number of years, and there is no method which enables one to determine the activity or quiescence of the infection. Given a group of children below the norm in height and weight, the tuberculous child will more frequently appear to be of normal height but far less often of normal weight. The tuberculous individual is often seen as the lanky child. *Conclusions:* 1. Using height and weight as the basis of comparison, tuberculous children more frequently attained the normal standard of gain that did those of the control series. 2. Neither the entire tuberculous nor control series reached the Children's Bureau standard, represented as 100 per cent, although the tuberculous group more frequently approached it. 3. The superiority of the tuberculous over the control series in gain, depend on the improvement in sanitation and food, and the removal of defects. 4. The child with hilum or tracheobronchial node tuberculosis in a group of underheight and underweight children, when properly treated, will more often be the one to attain the normal gain. This observation is equally applicable to cases seen in private practice.—*The Physical Development of Tuberculous Children, M. L. Blatt, Am. J. Dis. Child., June, 1921, xxi, 575.*

The Grancher Institute.—Grancher believed tuberculosis is not hereditary, but contagious in origin. The Institute he founded seventeen years ago for the protection of children from tuberculosis proves the soundness of his theory. When tuberculosis attacks a family living in confined quarters and strikes down one of the parents, infection of the children is nearly always inevitable. The Institute takes the healthy children from the tuberculous family and places them in the country, in the families of healthy country people, where they pass their school life up to or beyond the age of thirteen. Excellent country doctors choose the homes of the foster parents and look after the children without charge. The predisposing indirect causes of tuberculosis, as well as the immediate cause, the contagion in family life, are thus eliminated. The child put in a good home with fresh air and abundant, nourishing food, becomes a new being, physically and morally, and arrives full of vigor at the threshold of adolescence. Frequently he elects to remain in the country, the proportion of children remaining in their adopted homes being from 35 to 55 per cent. Homes for the care of infants have been established and are visited every week by a physician and are under the daily supervision of a visiting nurse. The Institute accepts only children who are free from tuberculosis and other infectious diseases. The Paris Institute has been in existence for nearly eighteen years; 400 children are at present in its charge and more than 2000 have passed through its hands. A statistical study of 165 tuberculous families gives the morbidity from tuberculosis among children left in the care of their infected relatives as 60 per cent, without counting those in whom the disease remained latent. The mortality in several years was was nearly 40 per cent. Among the 2,200 children who have passed through the Institute at Paris there have been only 7 cases of tuberculosis, and of these 5 recovered. The moral transformation of the children is equally remarkable. The Grancher Institute has at Paris only a small office and two paid employees. The remaining expenses are insignificant. Before the war the complete unkeep of a child did not exceed 400 francs a year; since then the cost has risen to 1,000 francs. In the simplest sanatorium, the cost is not less than 15 francs a day. In three years the amount would be at least 20,000 francs, without the certainty of a complete cure. The Institute rescues a child from tuberculosis at a cost of from 3,000 to 5,000 francs. At Paris the Public Office of Social Hygiene of the Department of the Seine is endeavoring to extend the work of the Grancher Institute. An appeal is made to health authorities to undertake the fight against tuberculosis by this means, the efficacy of which has been so thoroughly demonstrated. In the absence of sufficient resources, the Grancher Institutes have not been able to expand to the extent desired. About 15 branches were in existence before the war. Tuberculosis relief committees are now endeavoring to establish them in all the departments of France. The United States, Belgium, and Italy have already commenced the organization of such societies for the protection of the children.—*The Grancher Institute: Its Rôle in the Campaign Against Tuberculosis, Internat. J. Pub. Health, ii, 113.*

Tuberculous Children Sleep in Parks.—Tuberculous children from Westminister council schools have a class in St. James Park, London. In this class both health and education are considered. All the lessons take place in the open air, milk is provided for the children, and an hour's sleep is part of the daily routine. This siesta is taken in a sleeping bag on the park lawn, and serves not only to provide a beneficial rest but prevents the children from coming in contact with other children.—*News of the Week, Med. Rec., July 9, 1921, c, 73.*

The Results of X-Ray Treatment in Children.—Enlarged cervical lymph nodes are particularly evident in children. Isolated cases heal after 1 or 2 treatments, but the large indolent tumors require 5 o· 6 radiations with an interval of three to four weeks, lasting in all about six months. The fibrous indurated types are not influenced. Fluctuating tumors are punctured and then rayed. Fistulae are not contraindications, except that the infected skin is hypersensitive to the X-ray. To prevent the inflammation from spreading one may also radiate the healthy nodes. No harm has been noted in any case. The X-ray works faster and with greater certainty than the quartz light. It influences diseased bones the more the smaller they are, especially in spina ventosa. In tuberculosis of the ribs and sternum, it is better to use the X-ray postoperatively. It is especially suitable in the treatment of peritoneal tuberculosis with palpable tumors. The pure exudative types heal just as quickly by other methods as by the X-ray. Harmful skin reactions are rarely seen, except in neuropathic children who are particularly susceptible to any type of ray. If the quartz light is used in conjunction with the X-ray, it is wiser to cover up the areas treated by the latter. Nontuberculous conditions treated without results were Hodgkins disease, tumors of the spleen, malignant tumors and hyperplasia of the thymus. Arthritis deformans was somewhat improved.—*Erfahrungen bei der Röntgentiefentherapie im Kindesalter, P. Karger, Jahrb. f. Kinderh., 1920, xciii, 5.*

The Treatment of Surgical Tuberculosis in Children by Venous Hyperemia.—In children the induction of venous hyperemia is not only quite equal to any other modern method of treatment of white swelling of the knee joint, with the exception of heliotherapy, but it is distinctly superior in many respects. The rapid allaying of pain is one of the first results when the procedure is properly employed. The bad position assumed by the involved limb improves spontaneously as soon as the pain disappears. The possibility of carrying out the treatment without the use of casts or other means of immobilizing the limb avoids the development of trophic disturbances of the skin, muscles and bone. Finally, when other therapeutic measures—always excepting heliotherapy—usually end in more or less complete ankylosis (which is even yet regarded as an ultimate aim), venous hyperemia preserves the joints as well as their movement, and this is not uncommon, but almost invariably the rule. Therefore, it should be given a high place in infantile surgical therapeutics in which conservative measures are all-important. Added to these advantages, treatment by venous hyperemia is absolutely inoffensive when rightly carried out. The accidents attributed to it are invariably due to a defective technique. Muscular atrophy at the point of application of the elastic band, chronic edema and, exceptionally, gangrene have been recorded, but they are always the result of a too tight application of the band. Acute suppuration in the sinuses or in tuberculous abscesses may also ensue from the ischemia caused by a too tight ligature and tuberculous lesions apear to be particularly aggravated by this ischemia or by an exaggerated edema whch produces a too intense or prolonged stasis. Consequently it is of utmost importance to watch for the slightest symptoms accruing from too energetic compression and to remedy this immediately. For this reason the simultaneous application of the elastic band and cups should always be avoided, as they produce an excessive stasis over the bacillary lesion itself. As to the manner of action of venous stasis one is reduced to hypotheses, each of which probably has a certain value, but no one taken singly is sufficient to give a satisfactory explanation. It must be admitted that the true *modus operandi* of the procedure still remains to be explained, but the numerous excellent—even exceptional—results plead in its favor. Its use is indicated at the onset of white swelling of almost any joint when the lesions are especially in the periarticular soft parts, and in osteitis with or without sinuses, when the bone lesion is superficial. Venous hyperemia can also be used to complete the results of a surgical interference on the bones Like all other conservative measures this one is contraindicated in very advanced tuberculous lesions of the bones and in rapidly developing osteoarthritis, when it is urgent to prevent the occurrence of visceral degeneration by resorting at once to a radical operation.—*Editorial, Mec. Rec., June 11, 1921, xcix, 1011.*

Combination Tuberculin Tests in Cattle.—Intracutaneous and ophthalmic tests should be applied in addition to the subcutaneous test, in diagnosing tuberculosis in a previously tested herd of cattle, or where the disease has prevailed for a number of years. By using all three tests the decision arrived at may be assumed to be 100 per cent perfect. It could easily happen in a herd of 40 animals to miss one by merely using the ophthalmic test; and, unless check tests were applied, a tuberculous animal might be left in the herd and spread the disease to healthy cattle. The ophthalmic sensitizing disc should be applied when the herd is first inspected, to be followed immediately by the intracutaneous injection. The second tablet can be applied after the forty-eighth or seventy-second hour observation has been made. For the intracutaneous test one standard place of injection should be chosen and care used in interpreting the local reaction. The latter is considered positive when an area of infiltration is formed, varying in size from a small pea to a quarter in diameter.—*Combination Tuberculin Tests, D. K. Eastman, J. Am. Vet. M. Ass., June, 1921, lix, 338.*

Intracutaneous Tuberculin Test in Cattle.—A syringe of 2 cc. capacity, with long, slender glass barrel and a leather or rubber plunger, or a 25 minim syringe with a gauge to regulate the dose, is recommended. The animal must be properly restrained so as to insure a perfect injection. Should the needle be dislocated, a new site, higher or lower or on the opposite side, should be chosen. The seat of injection is into the fold either right or left, but at a lower point than has heretofore been chosen. This is preferable because the skin here is denser and the subcutaneous or areolar tissue is less abundant. When a reaction occurs low, it is more distinctly circumscribed and more readily detected. For the injection, permit the tail, slightly below the point where the caudal fold passes gradually into the nude, smooth undersurface, to rest in the palm of the left hand, with the thumb resting against the left side of the tail, the hand at about an angle of 45 degrees, allowing the point of the index finger to press lightly against the undersurface slightly to the right. Press this tissue to be injected out to the right, which brings it into view, at the same time holding the second and third fingers in readiness to grasp the syringe as soon as the insertion is made. In making the insertion, be sure that the bevel of the needle touches the skin and is parallel with its surface. The amount of tuberculin to be injected should not exceed two minims. Should a greater amount be injected unintentionally, a notation must be made on the test chart, recording the number or name, in order that the animal may be identified when making the interpretations. If care is used in examining every questionable animal and ascertaining its history it will materially aid in making a diagnosis and rendering a decision.—*The Intradermic Tuberculin Test, O. Ausgpurger, J. Am. Vet. M. Ass., June, 1921, lix, 340.*

Tuberculin Test of Cattle and Tuberculosis Control.—In California, 300,000 cattle have been subjected to the intracutaneous test. In the hands of an experienced operator this test is not likely to give a positive reaction when animals are not affected with tuberculosis. The reaction, however, may appear later than the time ordinarily set for the observation. Other tests used are the subcutaneous, the sensitized intracutaneous, the intrapalpebral and the ophthalmic. The subcutaneous test is cumbersome, time consuming and not always accurate. The sensitized intracutaneous test consists in repeating the test at about the same location on the fourth day following the first injection. It is supposed to be more searching than the subcutaneous or the ordinary intracutaneous test. The intrapalpebral apparently has no points of advantage over the intracutaneous test. The ophthalmic test alone does not give as good results as the tests mentioned, but a modification of it known as the sensitized ophthalmic, repeating the test after two days with 2 discs, has recently gained in favor in detecting advanced cases of tuberculosis known as spreaders. These frequently cannot be found by any other means, except possibly by the use of the serological test which has not as yet been sufficiently used in common practice to determine its real value. Various tests used repeatedly may fail to check the spread of tuberculosis in some herds. If 80 per cent of cattle in a badly affected herd react to any test, one can be satisfied with the result. Among the remaining 20 per cent there are likely to be some of the most dangerous spreaders of the entire herd. This 20 per cent can be materially reduced by using a combination of tests. When spreaders are present in a herd and means of detection fail, the herd must be considered 100 per cent tuberculous. It is encouraging to note the great majority of cases that have remained free from the disease when herds have been placed on the accredited herd list by the United States Bureau of Animal Industry, after having been declared as free. This to some extent may be attributed to the fact that probably not a high percentage of accredited herds originally contained a high percentage of reactors. In one county, among a herd

tested, not a single reactor was found, due to its geographical isolation. In another county, adjoining, where transportation and communication to the outside were easy, large numbers of tuberculous cattle were present. Practically nothing can be told from the physical appearance of an animal as to whether it will react to the test, but, given the history of a cow or herd, in a surprising number of cases the result may be predicted correctly. Dissemination is a potent factor. All that is necessary before making an intracutaneous test is to wipe the spot of injection clean. Unless the animal jumps, causing the needle to tear the skin, there need be no fear of infection. At a recent meeting of the United States Live Stock Sanitary Association at Chicago, a code for recording intracutaneous reactions was adopted. In California 20,000 tuberculous cows have been removed from raw milk dairies through the testing done under the pure milk law. It is estimated that about 5 per cent of the reactors are discharging tubercle bacilli at intervals or continuously through their milk. This means that, if it were not for the tuberculin testing done by the state, her unsuspecting citizens would be drinking raw milk from at least a thousand cows actually containing tubercle bacilli. To these should be added the other cows that would have contracted tuberculosis in dangerous form, had these 20,000 reactors remained in the raw milk herds. Add to this total the large number of cows that are spreaders in pasteurization herds which, but for the pure milk law, would be selling raw milk; and multiply this grand total by the milk from all healthy cows with which this contaminated milk from spreader cows would be mixed, and we have an enormous product of contaminated milk that cannot readily be grasped, but would include a great portion of our total supply of almost 63 million gallons annually.—*Some Observations Concerning Tuberculin Testing and Tuberculosis Control, J. J. Frey, J. Am. Vet. M. Ass., July, 1921, lix, 443.*

Tuberculosis of Horses.—This is generally considered of little economic importance, as of the thousands of horses which are autopsied annually, there are but few cases of tuberculosis reported. However horses, exposed to tuberculous cattle, may be a greater menace to livestock and public health than they have hitherto been regarded. For convenience we can divide horses into the unexposed and exposed. It is the exposed horse to which our attention should be drawn. This is by far the smaller group of the two, but of greater importance as regards tuberculosis. During the last two years 4 cases of tuberculosis in horses have been brought to the author's attention, all of which were exposed animals. At least 3 are to be classed as spreaders and the fourth, if not a spreader, was certainly dangerously near to that condition. To eradicate tuberculosis from herds continually exposed to such animals would be almost impossible. When we stop to think that these cases were all discovered as a result of their physical condition, one wonders how many cases might be found if special attention were given to this subject and all exposed horses tested with tuberculin. The author does not mean to recommend such a procedure, but rather to emphasize the fact that horses exposed to tuberculous cattle may contract the infection and become dangerous spreaders. Therefore, where conditions point to this possibility, exposed horses should be subjected to tuberculin tests.—*Tuberculosis of Equines and its Importance in Tuberculosis Eradication by the Accredited Herd Plan, F. Boerner, Jr., J Am. Vet. M. Ass., May, 1921, lix, 184.*

Prognosis of Pulmonary Tuberculosis.—An analysis of 300 incipient and moderately advanced cases shows that râles when present at the onset of treatment will, after from three to six months treatment, tend either to increase or diminish in more than half the cases. Only comparatively infrequently do they disappear or appear when previously absent. A fair number (about one in five or six) show no change in the area of râles heard. The roentgen ray will show no improvement in about one of seven cases, and approximately two-thirds will show definite improvement. Nearly three-quarters of the cases will show freedom from symptoms of activity. After from five to eleven years those patients in whom the râles increased in area while under treatment showed the highest mortality. When râles remained stationary during treatment, prognosis was not unfavorably influenced. Incipient or minimal cases have a better immediate and ultimate prognosis than the moderately advanced; moderately advanced a better prognosis than far advanced cases. Regardless of extent of lesion the cases becoming inactive under treatment have a much better prognosis than those which retain symptoms of activity. After the lapse of twenty years the cause of death was pulmonary tuberculosis in most of the traced cases. Those cases, which were inactive after treatment, have a better prognosis than those having symptoms of activity. Tubercle bacilli when present in the sputum make the prognosis much less favorable than when absent. This refers to longevity, general mortality and mortality from tuberculosis, and holds true for the incipient and moderately advanced cases.—*Prognosis of Pulmonary Tuberculosis, F. H. Heise, Canad. M. Ass. J., May, 1921, xi, 314.*